

स्वच्छ महाराष्ट्र अभियान (नागरी) अंतर्गत राज्यातील नागरी स्थानिक स्वराज्य संस्थांकडील शौचालयांच्या सेप्टिक टँक मधील मैल्याचे सुरक्षित, नियमित व्यवस्थापन करून व त्यावर प्रकीया करण्यासाठी हायब्रिड कोअर टेक्नॉलॉजी या तंत्रज्ञानास शासन मान्यता देण्याबाबत.

### महाराष्ट्र शासन

### नगर विकास विभाग

शासन निर्णय क्रमांक : स्वमअ-२०२०/प्र.क्र.८५/नवि ३४

हुतात्मा राजगुरु चौक, मादाम कामा मार्ग,

४ था मजला, मंत्रालय, मुंबई ४०००३२

दिनांक : १९ एप्रिल, २०२१

#### पहा :

१. शासन निर्णय, नगर विकास विभाग, क्र स्वभाअ २०१५/प्र.क्र.२३/नवि ३४ दि. १५.०५.२०१५
२. शासन परिपत्रक, नगर विकास विभाग, क्र स्वमअ २०१७/प्र.क्र.३१/नवि-३४, दि. १७.३.२०१७
३. शासन परिपत्रक, नगर विकास विभाग, क्र स्वमअ २०१७/प्र.क्र.२६३/नवि-३४, दि. ३०.१२.२०१७
४. शासन निर्णय, नगर विकास विभाग, क्र. स्वमअ २०१७/प्र.क्र.२६३/नवि-३४, दि. १५.१२.२०१८
५. शासन निर्णय, नगर विकास विभाग, क्र-स्वमअ-२०१९/प्र.क्र.८२/नवि ३४, दि. २४.०५.२०१९
६. शासन निर्णय, नगर विकास विभाग, क्र-स्वमअ-२०१९/प्र.क्र.१०५/नवि ३४, दि. ११.०९.२०१९
७. शासन निर्णय क्रमांक, नगर विकास विभाग, क्र-स्वमअ-२०१९/प्र.क्र.१२४/नवि ३४ दि. ८.११.२०१९

#### प्रस्तावना :

केंद्र शासनाच्या स्वच्छ भारत अभियानाच्या धर्तीवर संदर्भीय क्रमांक १ येथील शासन निर्णयान्वये राज्यामध्ये स्वच्छ महाराष्ट्र अभियानाची अंमलबजावणी सुरु आहे. या अभियानांतर्गत शहरांमधील ज्या कुटुंबांकडे शौचालयाची सुविधा नाही अशा कुटुंबियांना वैयक्तिक अथवा सामुदायीक शौचालयाची सुविधा उपलब्ध करून देवून शहरे “हागणदारी मुक्त” करणे, तसेच, घनकचरा व्यवस्थापन नियम, २०१६ नुसार शहरातील घनकचरा व्यवस्थापन करून शहरे “स्वच्छ” करणे या दोन प्रमुख बाबींचा समावेश आहे.

२. स्वच्छ महाराष्ट्र अभियानांतर्गत शहरे हागणदारी मुक्त करताना शहरांमधील ज्या भागात मलनिसःरण व्यवस्था अस्तित्वात आहे अशा भागातील शौचालये मैला व्यवस्थापनाच्या दृष्टिने मलनिसःरण व्यवस्थेस जोडण्यात आली आहेत. तर, जेथे मलनिसःरण व्यवस्था अस्तित्वात नाही अशा भागातील / शहरांमधील शौचालये सेप्टिक टँकला जोडण्यात आली आहेत. जी शौचालये मलनिसःरण व्यवस्थेस जोडण्यात आली आहेत त्या शौचालयांमधील मैल्यावर संबंधित शहरांतील मलनिसःरण प्रक्रिया केंद्रामध्ये (STP) प्रकीया होत आहे. परंतु, शहरातील ज्या भागात / ज्या शहरांमध्ये मलनिसःरण व्यवस्था उपलब्ध नसल्याने जी शौचालये सेप्टिक टँकला जोडण्यात आली आहेत अशा भागातील / शहरांतील शौचालयांच्या सेप्टिक टँक मधील मैला सुरक्षित व नियमित व्यवस्थापन करून त्यावर प्रकीया करणे आवश्यक आहे.

३. राज्यातील ३८४ शहरांपैकी ७३ शहरांमधील शौचालयांच्या सेप्टिक टँक मधील मैला सुरक्षित व नियमित व्यवस्थापन करून त्यावर प्रकीया होत आहे. उर्वरीत ३११ शहरांमधील सेप्टिक टँक मधील मैला सुरक्षित व नियमित व्यवस्थापन करून प्रकीया करणे आवश्यक असल्याने त्यासाठी योग्य तांत्रज्ञान निवडून त्या तंत्रज्ञानाची अंमलबजावणी करणे आवश्यक असल्याने स्वच्छ महाराष्ट्र अभियान अंतर्गत पर्यावरण नियोजन व तंत्रज्ञान केंद्र, अहमदाबाद (Centre for Environmental Planning and Technology (CEPT)) ह्या संस्थेबरोबर झालेल्या

सामंजस्य करारा (MoU) अंतर्गत या संस्थेने सेप्टिक टँक मधील मैल्यावर प्रक्रीया करण्यासाठी स्लज ड्राईंग बेड (एस.डी.बी) हे तंत्रज्ञान निवडून त्यावर आधारित सेप्टिक टँक मधील मैल्यावर प्रक्रीया केंद्र (FSTP) उभारण्याकरीता संदर्भ क्र. ७ येथील दि. ८.११.२०१९ रोजीच्या शासन निर्णयान्वये मान्यता देण्याता आली आहे.

४. दरम्यानच्या कालावधीत Scheduled Desludging चा पर्याय पुढे आलेला असून त्यानुसार, शहरातील मैल्यावर प्रक्रीया करावयाची झाल्यास प्रत्येक शहराला जास्त क्षमतेचे F S T P प्रकल्प उभारावे लागणार असून जागेच्या कमतरतेअभावि नविन तंत्रज्ञानाची गरज आहे. सद्या मान्य असलेल्या तंत्रज्ञानाची अंमलबजावणी करीत असताना असे दिसून आले की, सदर प्रकल्प राबविण्याकरीता जास्त जागेची आवश्यकता लागते. सद्यस्थितीत राज्यातील काही नागरी स्थानिक स्वराज्य संस्थेकडे स्वमालकीची जागा उपलब्ध नाही. त्यामुळे, कमी जागेमध्ये राबविणे शक्य होणाऱ्या हायब्रिड कोअर टेक्नॉलॉजी या तंत्रज्ञानास मान्यता देण्याची बाब शासनाच्या विचाराधिन होती.

### शासन निर्णय :

प्रस्तावनेत नमूद केलेल्या बाबींचा विचार करून, महाराष्ट्र जिवन प्राधिकरणाने पत्र क्रमांक मजीप्रा/मनीसंसकक्ष/नागरी/१३६/२०२१ दि. २२.०३.२०२१ अन्वये दिलेली तांत्रिक मान्यता विचारात घेवून, राज्यातील नागरी स्थानिक स्वराज्य संस्थांमध्ये FSTP प्रकल्पासाठी हायब्रिड कोअर टेक्नॉलॉजीस त्यांनी दिलेल्या परिच्छेद क्र. ३ मधील नमूद अटी व शर्तीच्या आधिन राहून शासन मान्यता देत आहे.

२. हायब्रिड कोअर टेक्नॉलॉजी राबविण्याकरीता महाराष्ट्र जिवन प्राधिकरणाने खालील प्रमाणे किंमत मंजूर केली आहे.

अ.क्र.	हायब्रीड कोअर टेक्नोलॉजी प्रकल्पाची क्षमता (KLD)	प्रकल्पाची किंमत (रुपये)
१	२	३
१	५ KLD	९७,९६,६२३.५१/- (SGST+CGST सह)
२	१० KLD	१,२२,३४,७४६.९४/- (SGST+CGST सह)
३	२० KLD	१,५०,६२,१४०.४१/- (SGST+CGST सह)

(सदर दर हे कोकण विभागाच्या (डी.एस.आर.) म.जी.प्रा दर सूची २०१९-२० व सा.बां.वि. दर सूची २०२०-२१ मध्ये नमूद दरानुसार ठरविण्यात आले आहेत. इतर विभागातील नागरी स्थानिक स्वराज्य संस्थेकरीता स्थानिक स्थिती, म.जी.प्रा दर सूची व सा.बां.वि. दर सूची, प्रमाणे सविस्तर संकल्पने व अंदाजपत्रके तयार करणे आवश्यक आहे.)

हायब्रिड कोअर टेक्नॉलॉजी संदर्भातील तांत्रिक बाबी व डिझाईन जोडपत्र-१ म्हणून या शासन निर्णयातसोबत जोडली आहे.

### ३. अटी व शर्ती:

- सदर तंत्रज्ञानाच्या अनुषंगाने बांधण्यात येणाऱ्या FSTP च्या उपांगामधून अपेक्षित मानकाचे BOD/COD मिळण्याबाबतची जबाबदारी संबंधित Technical Provider यंत्रणेची राहिल. सदर तंत्रज्ञान चे Assumed inflow parameter व Effluent parameter यापेक्षा जास्त किंवा कमी

- Quality आढळ्यास संबंधित नागरी स्थानिक स्वराज्य संस्थांनी शासनास अवगत करणे आवश्यक राहिल.
२. FSTP चे उपंगाची Sizing काही Assumption व Levels घेऊन संकल्पीत करून काढण्यात आले असून त्यामुळे संकल्पित क्षमते करिता उपांगाची Size ह्या कमी पडणार नाही किंवा योग्य असतील याची जबाबदारी संबंधित Technical Provider यंत्रणेची राहिल. Units ची संकल्पित Levels प्रमाणे उभारणी आवश्यक आहे.
  ३. खोदाई बाब प्रत्यक्ष कार्यक्षेत्रावर लागणाऱ्या भुस्तर नुसार घेणे आवश्यक आहे. अंदाजपत्रामध्ये सर्व साधारण सर्व खोदाई बाबींची तरतूद गृहित धरण्यात आली आहे. तथापी, कार्यक्षेत्रावर प्रत्यक्ष जो भुस्तर लागेल त्यानुसार, कार्यवाही करणे आवश्यक राहिल. अंदाजपत्रकात दर्शविलेल्या बाबी शिवाई इतर भुस्तर लागल्यास किंवा एखाद्या बाबीचा अंतर्भूत करायची झाल्याची त्याची अंमलबजावणी परस्पर न करता त्याबाबत नगर विकास विभागासोबत संपर्क साधून योग्य तो निर्णय घेणे बंधनकारक आहे. FSTP करिता प्रस्तावित शहर हे Hilly/MMRDA/Municipal etc. प्रमाणे असल्यास त्याप्रमाणे दरसूचीनुसार अंदाजपत्रकाच्या दरात सुधार करणे आवश्यक आहे.
  ४. प्रस्तावात धरण्यात आलेल्या Sewage pumps ह्या करिता Standby arrangement ची तरतूद करणे आवश्यक आहे. सदर प्रस्तावात नमूद Mechanical Equipment's ह्या नमूद manufacturers कडून घेणे आवश्यक आहे. काही बदल करावयाची झाल्यास संबंधित अधिकाऱ्याची मंजूरी आवश्यक आहे.
  ५. Biological Digester पासून Lamella Clarifier तसेच Holding sump पासून pressure sand fitters पर्यंत pumps प्रस्तावित असून इतर Units मध्ये Gravity Flow प्रस्तावित आहे. सदर inter connection pipe किंवा Channels चे संकल्पन सादर केले नसून त्याची जबाबदारी संबंधित यंत्रणेची राहिल.
  ६. महाराष्ट्र जीवन प्राधिकरण दरसूची मध्ये मटेरियल लीड घेण्याची तरतूद आहे. मात्र सध्यास्थितीत कोणत्या शहरात किती कि.मी. वर मटेरियल मिळू शकेल याची माहिती या क्षणी उपलब्ध नाही. यास्तव प्रत्येक काम करताना त्याची माहिती प्राप्त करून घेऊन मटेरियलचा लीड दर परिगणना करून त्याचा समावेश करावा. Lead Charges प्रमाणे अंदाजपत्रकातील दरात बदल करणे आवश्यक आहे.
  ७. सदर प्रस्ताव सध्या मागणी आधारित असल्याने जर काही दिवस FSTP मध्ये Sludge उपलब्ध न झाल्यास FSTP मधील Bio digester मधील liquid level व temperature maintain करावयाची जबाबदारी संबंधित यंत्रणेची राहिल.
  ८. सदर प्रस्तावात सादर केलेले अंदाजपत्रक हे Type Plan व कोकण विभागाच्या दरसूचीमध्ये असून स्थानिक स्थितीप्रमाणे सविस्तर संकल्पने व अंदाजपत्रके तयार करणे आवश्यक आहे.
  ९. सदर तंत्रज्ञानावर आधारित FSTP कार्यान्वित झाल्यास व भविष्यामध्ये Sewage Treatment Plant उभारण्यात आल्यास तेव्हा त्या प्रस्तावात ह्या चा वापर करण्यात नगरपालिकेस बंधनकारक राहिला. सदर FSTP चा वापर Isolated Areas किंवा ansewered Areas करिता वापर करणे आवश्यक राहिल.
  १०. सदर अंदाजपत्रक हे Type Estimate असून शहराच्या लोकसंख्येप्रमाणे FSTP ची क्षमता ठरवून त्याप्रमाणे अंदाजपत्रकास trial Pit प्रमाणे Excavation strata व इतर बाबी समावेश करून संकल्पन व अंदाजपत्रकास सक्षम अधिकाऱ्याकडून तांत्रिक मान्यता घेणे बंधनकारक असेल.
  ११. सदर मंजूरी ही स्वतंत्र योजनेची तांत्रिक मंजूरी म्हणून ग्राह्य धरण्यात येऊ नये.

१२. Royalty व GST बाबतीत ठेकेदाराने अदा केलेल्या रक्कमेच्या आधारे अदायगी करण्याची जबाबदारी संबंधित अंमलबजावणी करण्याच्या यंत्रणेची राहिल.
  १३. FSTP वापरात येणारी साहित्य व यांत्रिक सामुग्री ही relevant IS प्रमाणे वापरणे आवश्यक आहे. FSTP चा संकल्पित वर्षापर्यंत चालेल त्याप्रमाणे साहित्य वापरणे, तसेच Plant कार्यान्वीत झाल्यानंतर तांत्रिक सहाय्य देण्याची जबाबदारी संबंधित Technical Provider यंत्रणेची राहिल.
  १४. सदर तंत्रज्ञानाच्या Performance करीता ५ वर्षांचा O & M ची स्वतंत्र तरतूद करणे आवश्यक आहे
  १५. FSTP करीता आवश्यक जागा, Approach road, पाणी व विद्युत पुरवठा ही संबंधित स्थानिक स्वराज्य संस्थेची राहिल. त्याचप्रमाणे FSTP ची अंमलबजावणी करीता Quality Control, ३rd Party Monitoring सर्व records, logbook of daily treatment units, operation data sheet, testing records ह्या सर्व बाबींची पूर्तता संबंधित स्थानिक स्वराज्य संस्थेची राहिल.
  १६. सदर FSTP ची Structural Design व Sterility ची जबाबदारी Technical Provider ची राहिल. त्याच प्रमाणे Leakages मधून कोणत्या प्रकारचे units मधून कोणत्या प्रकारचे leakages किंवा अन्य बाधा येणार नाही. याची Technical Provider यांनी खबरदारी घेणे आवश्यक आहे.
४. सदर तंत्रज्ञानाची नागरी स्थानिक स्वराज्य संस्थानिहाय अंमलबजावणी व खर्चा संदर्भात सविस्तर सूचना स्वतंत्र आदेशान्वये देण्यात येतील.
५. सदर शासन निर्णय महाराष्ट्र शासनाच्या [www.maharashtra.gov.in](http://www.maharashtra.gov.in) या संकेतस्थळावर उपलब्ध करण्यात आला असून त्याचा सांकेतांक २०२१०४१९१३०७१४४३२५ असा आहे. हा आदेश डिजिटल स्वाक्षरीने साक्षांकित करून काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने.

( अजित पालवे )

कार्यासन अधिकारी, महाराष्ट्र शासन

प्रति :

- १) मा.मुख्यमंत्री यांचे प्रधान सचिव, मंत्रालय, मुंबई
- २) मा.राज्यमंत्री, नगर विकास यांचे खाजगी सचिव, मंत्रालय, मुंबई
- ३) मा.मुख्य सचिव, महाराष्ट्र राज्य, मंत्रालय, मुंबई
- ४) प्रधान सचिव (नवि-२) नगर विकास विभाग, मंत्रालय, मुंबई-३२
- ५) विभागीय आयुक्त (सर्व)
- ६) आयुक्त, तथा संचालक, नगरपरिषद प्रशासन संचालनालय, वरली, मुंबई
- ७) जिल्हाधिकारी (सर्व)
- ८) आयुक्त, सर्व महानगरपालिका
- ९) राज्य अभियान संचालक, स्वच्छ महाराष्ट्र अभियान (नागरी) मुंबई
- १०) प्रादेशिक उप संचालक, नगरपालिका शाखा, विभागीय आयुक्त कार्यालय (सर्व)
- ११) जिल्हा प्रशासन अधिकारी, नगरपालिका शाखा, जिल्हाधिकारी कार्यालय (सर्व)
- १२) मुख्याधिकारी, नगरपरिषदा / नगरपंचायती (सर्व)
- १३) निवडनस्ती, नवि-३४, नगर विकास विभाग, मंत्रालय, मुंबई.



जोडपत्र-१

ESTIMATE FOR 5 KLD FSTP							
MEASUREMENT SHEET							
S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
PART 1 FSTP							
<b>(1):- EXCAVATION WORKS</b>							
1	BIO-DIGESTER	1	9.78	3.63	1.65	58.58	M <sup>3</sup>
2	SLUDGE DRYING BED FOUNDATION	2	2.00	0.60	0.60	1.44	M <sup>3</sup>
3	MACHINE PLATFORM long span	2	10.37	0.60	0.60	7.47	M <sup>3</sup>
4	MACHINE PLATFORM short span	2	1.17	0.60	0.60	0.84	M <sup>3</sup>
5	SCUM REMOVAL CHAMBER	1	4.25	2.46	1.05	10.98	M <sup>3</sup>
6	SCREENING CHAMBER	1	1.20	2.06	0.60	1.48	M <sup>3</sup>
7	GRIT CHAMBER/INLET	1	2.66	2.66	0.60	4.25	M <sup>3</sup>
					<b>Total:-</b>	<b>85.03</b>	
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	BIO-DIGESTER PCC	1	9.18	3.03	0.10	2.78	M <sup>3</sup>
2	SLUDGE DRYING BED BASE PCC	1	7.54	2.00	0.10	1.51	M <sup>3</sup>
3	BELOW SIDE WALL PCC	2	2.00	0.60	0.10	0.24	M <sup>3</sup>
4	MACHINE PLAT FROM FOUNDATION WALL PCC long span	2	10.37	0.60	0.10	1.24	M <sup>3</sup>
5	MACHINE PLAT FROM FOUNDATION WALL PCC short span	2	1.17	0.60	0.10	0.14	M <sup>3</sup>
6	SCUM REMOVAL CHAMBER	1	3.96	1.86	0.10	0.74	M <sup>3</sup>
7	SCREENING CHAMBER	1	1.20	1.46	0.10	0.18	M <sup>3</sup>
8	GRIT CHAMBER/INLET	1	2.06	2.06	0.10	0.42	M <sup>3</sup>
9	AROUND THE PEVERS BLOCKS OF PAYMENT	1	45.36	0.3	0.10	1.36	M <sup>3</sup>
10	BASE CONC.IN TRUCK PARKING	1	12.5	4.7	0.10	5.88	M <sup>3</sup>
					<b>Total:-</b>	<b>14.49</b>	
<b>(3) :- REINFORCEMENT CONCRETE WORKS RAFT (Grade :-M30)</b>							
1	RAFT(30) FOR BIO-DIGESTER	1	8.98	2.83	0.30	7.62	M <sup>3</sup>
2	RAFT (M30) FRO SC UM REMOVAL CHAMBER	1	3.86	1.66	0.20	1.28	M <sup>3</sup>
3	RAFT (M30) FOR SCREENING CHAMBER	1	2.10	1.26	0.20	0.53	M <sup>3</sup>
4	RAFT (M30) GRIT CHAMBER	1	1.86	1.86	0.20	0.69	M <sup>3</sup>
					<b>Total:-</b>	<b>10.13</b>	
<b>(4) :- REINFORCEMENT CONCRETE WORKS FOR BEAM(Grade :-M30)</b>							
1	SLUDGE DRYING BED SIDE BEAM	2	2.20	0.23	0.23	0.23	M <sup>3</sup>
2	BEAM PARTITION CENTER WALL	1	8.38	0.23	0.30	0.58	M <sup>3</sup>
3	FOUNDATION BEAM IN MACHINE PLAT FORM LONG SPAN	2	10.00	0.23	0.30	1.38	
	BEAM IN MACHINE PLAT FORM SHORT SPAN	2	1.54	0.23	0.30	0.21	
					<b>TOTAL</b>	<b>2.40</b>	
<b>(5) :- REINFORCEMENT CONCRETE WORKS FOR COLUMN (Grade :-M30)</b>							
1	COLUMN (M300)	6	0.23	0.23	2.35	0.75	M <sup>3</sup>
					<b>TOTAL</b>	0.75	
<b>(6) :- REINFORCEMENT CONCRETE WORKS FOR Vertical Wall/SLAB (Grade :-M30)</b>							
1	BIO -DIGESTER LONG SPAN OUTER WALL	2	8.78	0.20	2.35	8.25	M <sup>3</sup>
2	BIO-DIGESTER SHORT SPAN OUTER WALL	2	2.23	0.20	2.35	2.10	M <sup>3</sup>
3	BOI-DIGESTER ANOXY CHAMBER PARTITION WALL	1	2.23	0.20	2.35	1.05	M <sup>3</sup>
4	BIO-DIGESTER SLAB	1	8.78	2.63	0.15	3.46	M <sup>3</sup>
5	MACHINE PLAT FORM SLAB	1	10.00	2.00	0.15	3.00	M <sup>3</sup>
					<b>TOTAL</b>	<b>17.86</b>	
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings, foundations,slabs, beams, columns, -----etc. complete.(including cost of binding wire) IS 1786, (Bd-F-17/306)</b>							
	TOTAL RCC QTY.=10.13+2.40+0.75+17.86 = 31.14					2.80	MT
	STEEL -90KG/CUM						
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	BIO-DIGESTER PARTION WALL(BUFFLE)	5	1.00	0.23	1.80	2.07	M <sup>3</sup>
2	BIO-DIGESTER RETURNING WALL	7	1.00	0.23	2.35	3.78	M <sup>3</sup>
3	BIO-DIGESTER CENTRE WALL	1	7.00	0.23	1.45	2.33	M <sup>3</sup>
4	MACHINE PLAT FORM FOUNDATION WALL long span	2	10.00	0.23	0.20	0.92	M <sup>3</sup>
5	MACHINE PLAT FORM FOUNDATION WALL short span	2	1.54	0.23	0.20	0.14	M <sup>3</sup>
6	MACHINE PLATFORM ABOVE GROUND LEVEL LONG WALL	2	10.00	0.23	1.12	5.15	M <sup>3</sup>
7	MACHINE PLATFORM ABOVE GROUND LEVEL SHORT WALL	2	1.54	0.23	1.12	0.79	M <sup>3</sup>

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
8	SLUDGE DRYING SHORT SPAN WALL	2	2.00	0.23	1.25	1.15	M³
9	SCUM REMOVAL CHAMBER LONG SPAN WALL	2	3.75	0.23	2.00	3.45	M³
10	SCUM REMOVAL SHORT SPAN WALL	2	1.00	0.23	2.00	0.92	M³
11	SCREENING CHAMBER LONG SPAN WALL	2	2.27	0.23	1.45	1.51	M³
12	GRIT CHAMBER LONG SPAN WALL	2	1.66	0.23	1.45	1.11	M³
13	GRIT CHAMBER SHORT SPAN WALL	1	1.20	0.23	1.45	0.40	M³
14	GRIT CHAMBER SHORT SPAN WALL	1	0.60	0.23	1.45	0.20	M³
					<b>Total:-</b>	<b>23.94</b>	
<b>(9) :- Hard Course/ MOORUM Filling Work</b>							
1	Sludge Drying Bed Hard course Filling (Moorum)	1	7.54	2.00	0.65	9.83	M³
2	Hard course Filling Machine Platform Foundation	1	9.54	1.60	1.10	16.79	M³
					<b>Total:-</b>	<b>26.62</b>	
<b>(10) :- Media Filter FOR SLUDGE DRYING BED</b>							
1	2 to 12 mm mix gravel filter media	1	7.54	2.00	0.20	3.02	M³
					<b>Total:-</b>	<b>3.02</b>	
<b>(11) :- Pevers Block Work</b>							
1	Pevers Blocks for sludge drying bed	1	7.54	2.00		15.08	M²
2	Pevers Blocks In front of Plant Long span	1	11.87	1		11.87	M²
3	Pevers Blocks In Left side of Plant short span	1	6.58	1		6.58	M²
4	Pevers Blocks In back side of Plant Long span	1	13.53	1		13.53	M²
5	Pevers Blocks in side of screen & Scum chamber	1	2.71	2.3		6.23	M²
		1	2.86	0.83		2.37	
		1	1.18	0.76		0.90	
6	Pevers Blocks in side of screen & Scum chamber	1	1.97	1		1.97	M²
					<b>Total:-</b>	<b>58.53</b>	
<b>(12) :- PLASTERING IN BIO DIGESTER</b>							
1	Both side plastering in Bio-Digester chamber	10	1.00	1.80		18.00	M²
2	Both side plastering in Bio-Digester chamber	22	1.00	2.30		50.60	M²
3	Center wall plastering in Bio-Digester chamber	2	7.00	1.75		24.50	M²
4	Bio digester outer long wall plastering	2	11.80	2.30		54.28	M²
5	plaster in scum removal outer	1	3.75	2.00		7.50	M²
		1	2.69	2.00		5.38	M²
		1	1.46	2.00		2.92	M²
6	plaster in scum removal inner	2	3.30	2.00		13.20	M²
		4	1.00	2.00		8.00	M²
7	screening outer	2	2.20	1.55		6.82	M²
	screening inner	2	2.43	1.55		7.53	M²
8	grit chamber outer	3	1.66	1.55		7.72	M²
		1	0.60	1.55		0.93	M²
	grit chamber inner	3	1.20	0.90		3.24	M²
		1	0.60	0.90		0.54	M²
					<b>Total:-</b>	<b>211.16</b>	M²
<b>PART 2) GAURD ROOM ,TOILET,BOUNDARY WALL</b>							
<b>(1) :- Excavation For Guard Room Foundation/Pilling</b>							
1	footing Excavation	6	1.50	1.50	1.00	13.50	M³
2	Excavation GUARD RM wall foundation long wall	2	2.80	0.60	0.60	2.02	M³
	Excavation GUARD RM wall foundation short wall	2	1.80	0.60	0.60	1.30	M³
	Excavation TOI. wall foundation wall	1	0.80	0.60	0.60	0.29	M³
3	Excavation for column footing (C1 type)	2	1.50	1.50	1.00	4.50	M³
4	Excavation for column footing (C2 type)	23	1.20	1.20	1.00	33.12	M³
5	Excavation below boundary wall	1	30.96	0.60	0.60	11.15	M³
					<b>Total:-</b>	<b>65.87</b>	M³
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	Column for guard rm& toilet	6	1.50	1.50	0.10	1.35	M³
2	Brick wall foundation PCC	1	20.00	0.40	0.10	0.80	M³
3	Guard Room Flooring PCC	1	3.00	4.00	0.05	0.60	M³
4	Toilet Flooring PCC	1	2.10	1.20	0.05	0.13	M³
5	Urine Pot Flooring PCC	1	1.70	0.70	0.05	0.06	M³
6	PCC for boundary wall column footing (C1 type)	2	1.50	1.50	0.10	0.45	M³

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
7	PCC for boundary wall column footing (C2 type)	23	1.20	1.20	0.10	3.31	M³
8	PCC below boundry wall	1	30.96	0.60	0.10	1.86	M³
					<b>Total:-</b>	<b>8.56</b>	
<b>(3) Footing</b>							
1	column footing raft for GUARD RM& TOI. (M20)	6	1.20	1.20	0.25	2.16	M³
2	RAFT for boundary wall column footing (C1 type)	2	1.20	1.20	0.25	0.72	M³
3	RAFT for boundary wall column footing (C2 type)	23	1.00	1.00	0.25	5.75	M³
					<b>Total:-</b>	<b>8.63</b>	M³
<b>(4) Column</b>							
1	GUARD RM& TOI. Column (M20)	6	0.23	0.23	4.25	1.35	M³
2	boundary wall column(C1 type)	2	0.40	0.40	2.15	0.69	M³
3	boundary wall column (C2 type)	23	0.23	0.23	2.15	2.62	M³
					<b>Total:-</b>	<b>4.65</b>	M³
<b>(5) Beam &amp; lintal beam (M20)</b>							
1	Slab beam long span	2	4.46	0.23	0.20	0.41	M³
2	Slab beam short span	2	3.00	0.23	0.20	0.28	M³
3	Toilet Slab Beam Long span slab beam	1	2.60	0.23	0.30	0.18	M³
4	Toilet Slab Beam Short span slab beam	2	1.20	0.23	0.30	0.17	M³
5	Plinth Beam long span	2	4.00	0.23	0.30	0.55	M³
6	Plinth Beam short span	2	3.00	0.23	0.30	0.41	M³
7	Lintel beam above door	2	3.60	0.23	0.23	0.38	M³
8	Lintel beam above window	2	1.50	0.23	0.23	0.16	M³
9	Toilet Long span plinth beam	1	2.60	0.23	0.30	0.18	M³
10	Toilet Short span plinth beam	2	1.20	0.23	0.30	0.17	M³
11	BOUNDARY WALL PLINTH BEAM	1	61.60	0.23	0.23	3.26	M³
					<b>Total:-</b>	<b>6.14</b>	M³
<b>(6) RCC WALL &amp;SLAB (M20)</b>							
1	Guard room	1	4.66	3.66	0.13	2.13	M³
2	Toilet Short span wall	1	2.66	1.45	0.13	0.48	M³
					<b>Total:-</b>	<b>2.61</b>	M³
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings, foundations,slabs, beams, columns, -----etc. complete.(including cost of binding wire) IS 1786, (Bd-F-17/306)</b>							
	TOTAL RCC QTY.=-	22.04					
	STEEL -90KG/CUM					1.98	MT
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	guard room long wall	2	4.00	0.23	3.30	6.07	M³
2	guard room long wall	2	3.00	0.23	3.30	4.55	M³
3	Toilet long wall	1	2.56	0.23	3.30	1.94	M³
4	Toilet Short wall	1	1.05	0.23	3.30	0.80	M³
5	BOUNDARY WALL	1	63.89	0.23	1.67	24.54	M³
					<b>Total:-</b>	<b>37.91</b>	M³
<b>(9) :- PLASTERING WORKS</b>							
	Plastring long wall (Inner)	2	4.00		3.00	24.00	M²
	Plastring short wall (Inner)	2	3.00		3.00	18.00	M²
	Plastring Ceiling	1	4.00	3.00		12.00	M²
	Plastring long wall (Outer)	2	4.46		3.73	33.23	M²
	Plastring short wall (Outer)	2	3.46		3.73	25.78	M²
	Plastring toilet (Inner)	2	2.10		3.00	12.60	M²
	Plastring toilet (Inner)	2	1.05		3.00	6.30	M²
	Plastring toilet CEILING (Inner)	1	2.10	1.05		2.21	M²
	Plastring long wall (Outer)	1	2.56		3.73	9.55	M²
	Plastring short wall (Outer)	1	1.45		3.73	5.41	M²
	Plastring boundry wall at Inner side	1	70.43		1.67	117.62	M²
	Plastring boundry wall at outer side	1	71.58		1.67	119.54	M²

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
					<b>Total:-</b>	<b>386.22</b>	M <sup>2</sup>
10)	<b>Painting/Colouring Work for Guard Room</b>						
	As per item no.9					<b>386.22</b>	M <sup>2</sup>
11)	<b>Guard Room Door</b>	1	1.07		1.83	1.95	M <sup>2</sup>
	Toilet Door	1	0.76		1.83	1.39	M <sup>2</sup>
					<b>Total:-</b>	<b>3.34</b>	M <sup>2</sup>
12)	Window	2	0.90		0.90	<b>1.62</b>	M <sup>2</sup>
13)	VENTILATOR	2	0.45		0.45	<b>0.41</b>	M <sup>2</sup>
14)	<b>Guard Room Plinth filling</b>	1.00	4.00	3.00	0.60	7.20	M <sup>3</sup>
	<b>Toilet Plinth filling</b>	1.00	2.10	1.05	0.60	1.32	M <sup>3</sup>
					<b>Total:-</b>	<b>8.52</b>	M <sup>3</sup>
	OTHERS						
1)	<b>MS gate</b>						
	Main Gate	2	2.50			2.00	no
	WICKET Gate	1	1.00			1.00	no.
2)	W.C. PAN	1	Nos				
3)	Wash Basin	1	Nos				
4)	Urin Pot	2	Nos				
5)	UPVC PIPE 4" dia	6	mt				
6)	Electric Fan	1	Nos				
7)	LED BULB 100 WATT	4	Nos				
8)	Bulb Holders	4	Nos				
9)	Electric wire	20	MT				
10)	PVC pipe for electric fitting	10	MT				
11)	Power switch Board	2	Nos				

DESIGN OF KLD CAPACITY FSTP			
	Catchment Area of FSTP		KLD
Values adopted from CPHEEO manual on sewage treatment plant November 2013 Chapter 9 table 9.13 page 9-43			
Parameter	Value adopted	Parameter	Value adopted
Quantity of effluent discharge	5		KLD
	5		M3/day
Colour	Black	Unobjectionable	
Odour	Smell like H <sub>2</sub> S	Unobjectionable	
Temperature	18°C-27°C	-	
pH		5.5-9.0	
total solid	40000.0	≤100	Mg/L
total dissolved solid	25000.0		Mg/L
Unsettled solid	15000.0	≤100	Mg/L
Volatile solid	10000.0		Mg/L
Total BOD <sub>20</sub> °C	100	≤10	Mg/L
COD	2000	≤50	Mg/L
Oil & Grease	6000	≤10	Mg/L
Total Nitrogen (TKN)	700	-	Mg/L
N-NH <sub>4</sub>	150.00	-	Mg/L
Org-N	550.00	-	Mg/L
N-NO <sub>3</sub>	-	-	Mg/L
Total P	250	-	Mg/L
Alkalinity		-	Mg/L
total Coliform	100000	≤1000	Mpn/100 MI
Minimum values have been adopted between discharge standard into inland surface water and that for and land for irrigation			
TREATED SEWAGE QUALITY			
	As per CPCB NGT		
BOD <sub>20</sub> °C	≤10	Mg/L	
Total Unsettled solid	≤100	Mg/L	
COD	≤50	Mg/L	
As	≤10	Mg/L	
Cd	≤5	Mg/L	
Cr	≤50	Mg/L	
Cu	≤300	Mg/L	
Pb	≤100	Mg/L	
Hg	≤0.15	Mg/L	
Ni	≤50	Mg/L	
Mn	≤1000	Mg/L	
C/N Ratio	20-40		
total Coliform	1000	MPN/100MI	
Quantity of Sewage Generated	5000.00	Lpd	
	5.00	KLD	
	5.00	Cum/day	
Raw Sewage Characteristics			
1 Average Sewage flow entering the treatment plant	5000.00	lpd	
Assumed Peak Factor	1.00		DEWATS
2 Peak Sewage flow entering the treatment plant	5000.00	lpd	
3 COD	25000.00	mg/Lt	
4 BOD	6500.00	mg/Lt	
5 TDS	15200.00	mg/Lt	
6 TSS	15000.00	mg/Lt	
7 pH	4.5 to 11.5		
Inlet Chamber or GRIT Chamber			
Number of unit	1	no	Number of unit
total collection time feeding hour	8	hour	
Quantity of Flow Ave	3000 li per hour	because collecting from pool vehicle	
	0.05	Cum/minute	
Assumed Detention period	14.00	minute	
Volume of the Inlet Chamber	0.70	Cum	
Assumed Depth of flow	0.50	m	

DESIGN OF KLD CAPACITY FSTP			
	Capacity of Inlet Chamber		KLD
	Area Required for Inlet Chamber	1.40	Sq.m
	Assumed Length to Breadth Ratio	1.00	
	Breadth of the Tank	1.20	m
	Length of the Tank	1.20	m
	Proportion of Design Capacity for GRIT Chamber	2	2
	2. Straining Capacity		
	Peak Design Flow	0.000	Cumec
	Assume Clear spacing between bars	10.00	mm
	Velocity ahead of screen	0.40	m/sec
	Area of Screen Channel, A = b/Va	0.00	m <sup>2</sup>
	Strand	0.15	
	Keeping Side Water Depth	0.25	m
	OVER ALL Width of straining chamber	0.00	m
	Strand	0.00	m
	Water depth upstream, b = A/W	0.25	m
	diameter of bar	0.006	m
	Number of opening in chamber, W = X.o + X - 1 Where, X = No. of Opening Clear Space between bars = Thickness of plate	0.00	no
	Strand	38.00	no
	Total effective width of opening, W excluding bar	0.372	m
	Assume Angle of inclination	60.00	Degree
	Assumed Detention Period in the Screen channel	5.00	sec
	Assume Length of the screen chamber	2.00	m
	Strand	0.00	m
	Inclined height of the screen, b	0.29	m
	Velocity through the screen, V = Q/H1.W	0.00	m/sec
	Head loss thru screen in normal condition, $h_1 = 0.0729 \frac{V^2}{2} - Va^2$	-0.01	m
	Head loss on 50% logging $h_1 = 0.0729 \frac{V^2}{2} - Va^2$	-0.01	m
	Water Depth downstream Hb, $a-b + Va^2/2g - V^2/2g + Ha$ Head loss thru screen in normal condition	0.27	m
	Water Depth downstream Hb, $a-b + Va^2/2g - V^2/2g + Ha$ Head loss thru screen in logged condition	0.27	m
	Proportion of Design Capacity for Sand Settling Chamber	0 M	0 M
	Design Capacity	00.00	mg/Lt
	Capacity	25000.00	mg/Lt
	Maximum rate		
	No. of tank	1	Strand
	Computation of Settling Velocity Stokes Law		
	Kinematic Viscosity of Effluent assumed	0.0000011	m/sec
	Particle Diameter assumed	0.000150	m

Page 3 of 8

DESIGN OF KLD CAPACITY FSTP			
Parameter	Value	Unit	
Type of Pump - Submersible/Horizontal Centrifugal			
Average Flow	5.00	Cum/day	
Number of Working hours	20	hr	
Flow Capacity of Pump required	0.25	Cum/hr	
Proposed No. of pumps of 2W & 2S	0	Cum/hr	
Power required	0.03	hp	
HP required for pump	0.50	hp	
<b>AN Aeration Tank</b>			
Peak Design Flow	5.00	Cum/day	
Assumed Detention period	2.1	hour	
Volume of the Tank	0.4375	Cum	
Assumed Depth of Liquid Column	1.8	m	
Area required for the equalization tank	0.243055556	Sq.m	
No. of Tanks Proposed	2		
Area required for each equalization tank	0.121527778	Sq.m	
Length to Breadth ratio	1		
Breadth of the tank	0.5	m	
Length of the tank	0.5	m	
<b>Proposed Dewatering AN Aeration Tank SWD 0 Fr</b>			
Mixing Arrangement			
Assumed BOD reduction in the tank	10%	Percent	
Incoming BOD of Raw Effluent	175.00	mg/L	
BOD to be reduced	17.5	mg/L	
BOD Load	0.1	kg/day	
Oxygen required to remove BOD load	2	kg/kg of BOD	
Oxygen required	0.2	kg/day	
	0.01	kg/hr	
Assumed Air Required for Aeration	0.46	Cum/hr	
Proposed Capacity of Aeration Tank	5.00	Cum/hr	
<b>BOD AND COD REDUCTION AFTER AN</b>			
BOD Reduction	0		
COD Reduction	0		
BOD Reduction after AN		mg/Lt	
COD Reduction after AN	675.00	mg/Lt	
<b>Aeration Tank 2</b>			
Design Flow Rate, Q		m <sup>3</sup> /d	
<b>Pre-aeration for First Stage</b>			
Ave. Influent BOD, S <sub>0</sub>	175.5	g/m <sup>3</sup>	
Estimated Effl. BOD, S <sub>e</sub>	35	g/m <sup>3</sup>	
Design Value of BOD Surface			
Area Loading Rate (SALR)	15	g/m <sup>2</sup> /d	
<b>Pre-aeration for Second Stage</b>			
Target Effluent BOD, S <sub>2</sub>	7	g/m <sup>3</sup>	
Estimated Infl. BOD, S <sub>2</sub>	35	g/m <sup>3</sup>	
Design Value of BOD Surface			
Area Loading Rate (SALR)	5	g/m <sup>2</sup> /d	
Carrier Sp. Surface Area	396	m <sup>2</sup> /m <sup>3</sup>	
Carrier Sp. Wt.	20	g/m <sup>3</sup>	
Liquid Depth in Tank	2	m	
Tank L:W ratio	1.5		

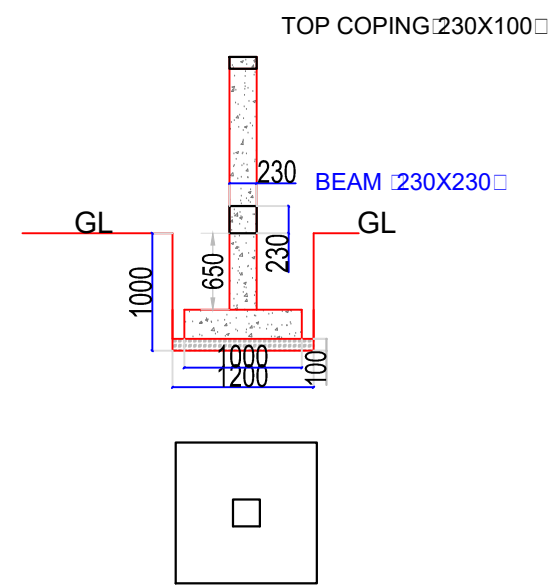


DESIGN OF KLD CAPACITY FSTP			
Carrier Fill		KLD	
Design Carrier Fill	40		
Carrier Void Space	60		
BOD Daily Loading	0	g/day	
	0	g/day	
Carrier Surface Area needed	46.8	m <sup>2</sup>	
Calculated Carrier Volume	0.118	m <sup>3</sup>	
Liquid Depth in Tank	2.2	m	
Calculated Tank Width	1.0	m	
Calculated Tank Length	2.1		
Calculated Tank Volume	4.6	m <sup>3</sup>	
<b>Secondary Settling Tank</b>			
BOD Daily Loading	0	g/day	
	0	g/day	
Liquid Depth in Tank	2.2	m	
Calculated Tank Width	1	m	
Calculated Tank Length	1.5	m	
Calculated Tank Volume		m <sup>3</sup>	
<b>Design and Construction After Treatment</b>			
Design Rate	0		
Construction Rate	0		
Design Rate of Treatment		mg/L	
Construction Rate of Treatment	135.00	mg/L	
Design Rate of Treatment	2.22	L/min	
Construction Rate of Treatment	0		
Design Rate of Treatment	0		
Construction Rate of Treatment	0.02	mg/L	
Construction Rate of Treatment	27.00	mg/L	
<b>Provision of Treatment and Construction</b>			
<p>1. The design and construction of the treatment plant shall be in accordance with the provisions of the Water Pollution Control Act, 1987 and the rules made thereunder.</p> <p>2. The design and construction of the treatment plant shall be in accordance with the provisions of the Water Pollution Control Act, 1987 and the rules made thereunder.</p> <p>3. The design and construction of the treatment plant shall be in accordance with the provisions of the Water Pollution Control Act, 1987 and the rules made thereunder.</p>			
<b>IV. Construction of Treatment Plant</b>			
O <sub>2</sub> needed per g BOD	2.00	g O <sub>2</sub> /g BOD	
SOTE at Function of Depth	2.50	per m depth	
AOTE/SOTE	0.5		
Pressure Drop at Diffuser	0.030	bar	
From m/f/vendor			
Depth of Diffuser	2.0	m	
Standard Temperature	25	°C	
Standard Pressure	1.014	bar	
Atmospheric Pressure	1.014	bar	
Air Density at STP	1.200	g/m <sup>3</sup>	
O <sub>2</sub> Content in Air	0.2770	g/m <sup>3</sup>	
<b>8. Design of Treatment Plant</b>			
Design Rate of Treatment	0.0	W	
Design Rate of Treatment			
Incoming BOD of Raw Effluent	175.00	mg/L	
BOD to be reduced	35	mg/L	
BOD Load	0.9	g/day	
Oxygen required to remove BOD load	2	g/g of BOD	
Oxygen required	1.8	g/day	
	0.22	g/hr	

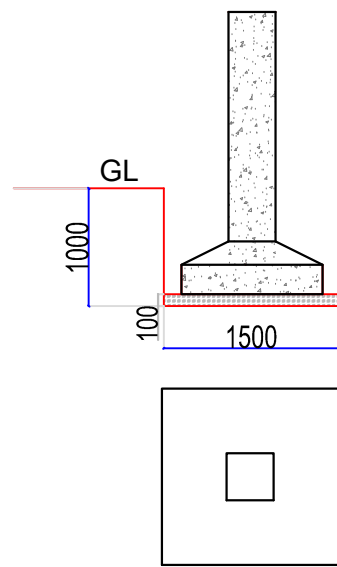
DESIGN OF KLD CAPACITY FSTP			
Component	Value	Unit	
<b>Aeration 1</b>	13.82	m <sup>3</sup>	
<b>Aeration 2</b>	2.76	m <sup>3</sup>	
Incoming BOD of Raw Effluent	35.10	mg/L	
BOD to be reduced	7	mg/L	
BOD Load	0.2	kg/day	
Oxygen required to remove BOD load	2	kg/kg of BOD	
Oxygen required	0.4	kg/day	
	0.04	kg/hr	
<b>Aeration 1</b>	13.82	m <sup>3</sup>	
<b>Aeration 2</b>	2.76	m <sup>3</sup>	
Anoxic	0.46	m <sup>3</sup>	
Total	17.04	m <sup>3</sup>	
<b>Sedimentation</b>			
Assumed Detention time	60.00	Minute	
Average Flow	5.00	Cum/day	
Volume of the tank	0.21	Cum	
Provide a depth of tank as	1.50	m	
Area of the Tank	0.14	Sq.m	
Square tank Size	0.40	m	
<b>FRP VESSEL 0.0"</b>			
<b>12 Pre-aerated Sand Filter</b>			
Average Flow	5.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Flow	0.63	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sq.m	
Area of the Filter required	0.31	Sq.m	
<b>FRP VESSEL 0.0"</b>			
<b>13 Sand Filter</b>			
Average Flow	5.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Flow	0.63	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sq.m	
Area of the Filter required	0.31	Sq.m	
Diameter of the Filter Required	0.70	m	
<b>FRP VESSEL 0.0"</b>			
<b>Effluent Discharge</b>			
Discharge Rate	0.00		

DESIGN OF KLD CAPACITY FSTP			
	COD/Ammonia Nitrogen		KLD
	COD	00	
	Ammonia Nitrogen		mg/Lt
	COD	22.95	mg/Lt
	Ammonia Nitrogen		
	Pre-treatment	0	COD
		00	Ammonia Nitrogen
15	Dissolved Air Flotation (DAF) IN LINE		
	COD	20.00	
	COD	20.00	
	Ammonia Nitrogen		mg/Lt
	COD	18.36	mg/Lt
16	TREATED WATER TANK		
	total quantity of sludge	5	CUM
	TOTAL LOSS IN PROCESS	15.0	
	TOTAL TREATED WATER	4.25	CUM
	Peak Design Flow	4.25	Cum/day

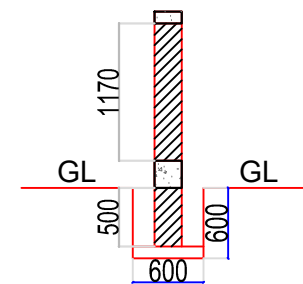
DESIGN OF KLD CAPACITY FSTP			
C	A		KLD
Assumed Detention period	2	hour	
Volume of the Tank	1.0625	Cum	
Assumed Depth of Liquid column	1.8	m	
Area required for the tank	0.59027778	Sq.m	
No. of Tanks Proposed	1		
area required for each tank	0.59027778	Sq.m	
Length to Breadth ratio	1		
Breadth of the tank	1	m	
Length of the tank	1	m	



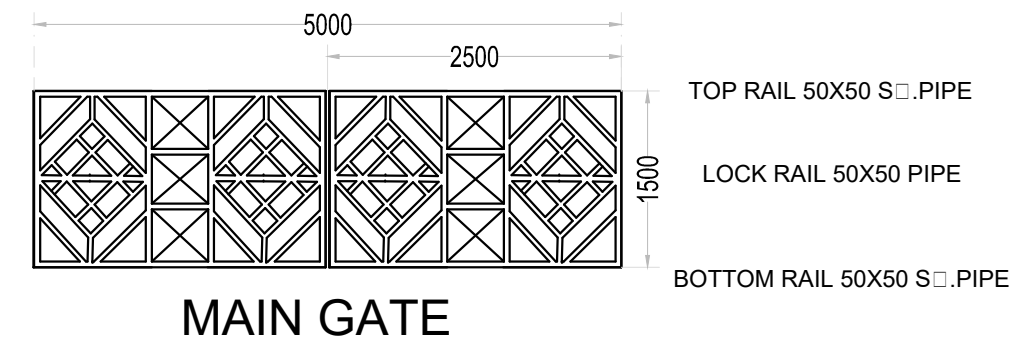
DETAIL OF C2  
23 NO.



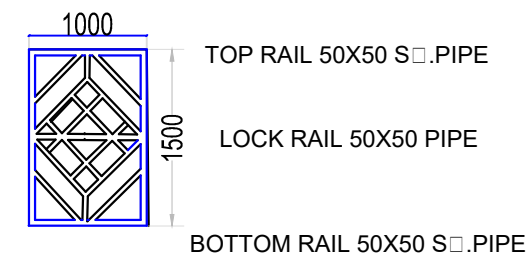
DETAIL OF C1  
2 NO.



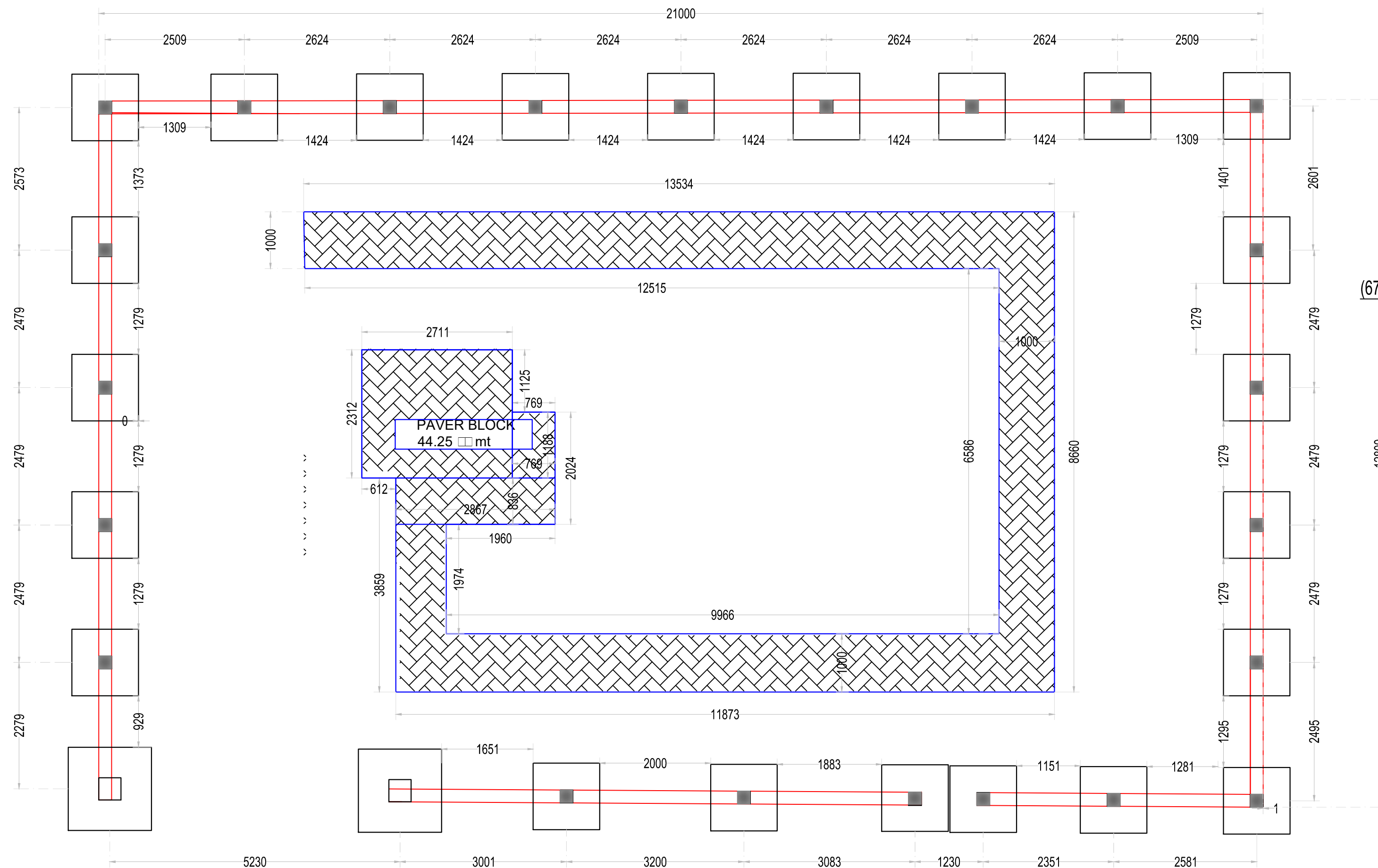
SEC. OF BOUNDARY WALL



MAIN GATE

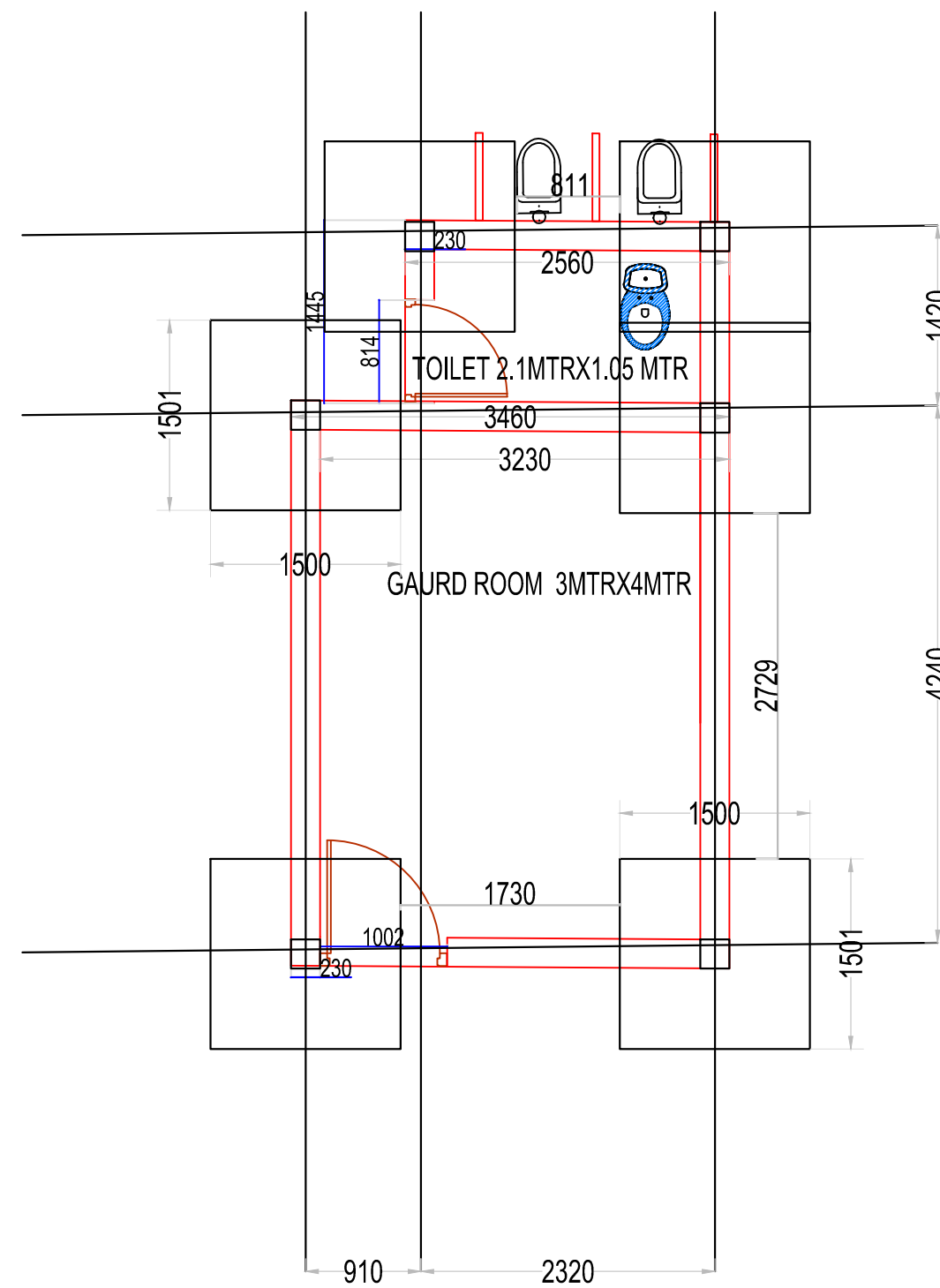
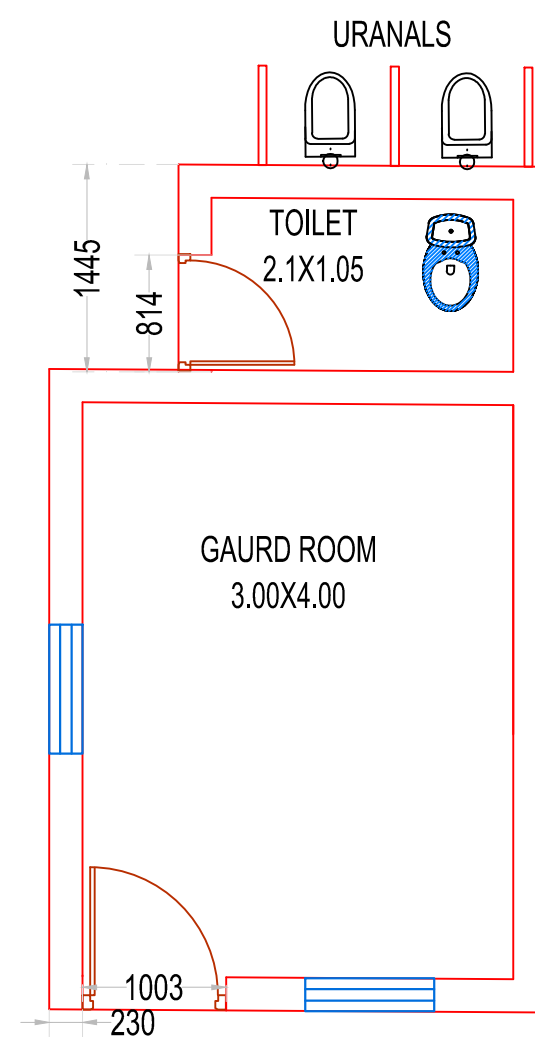
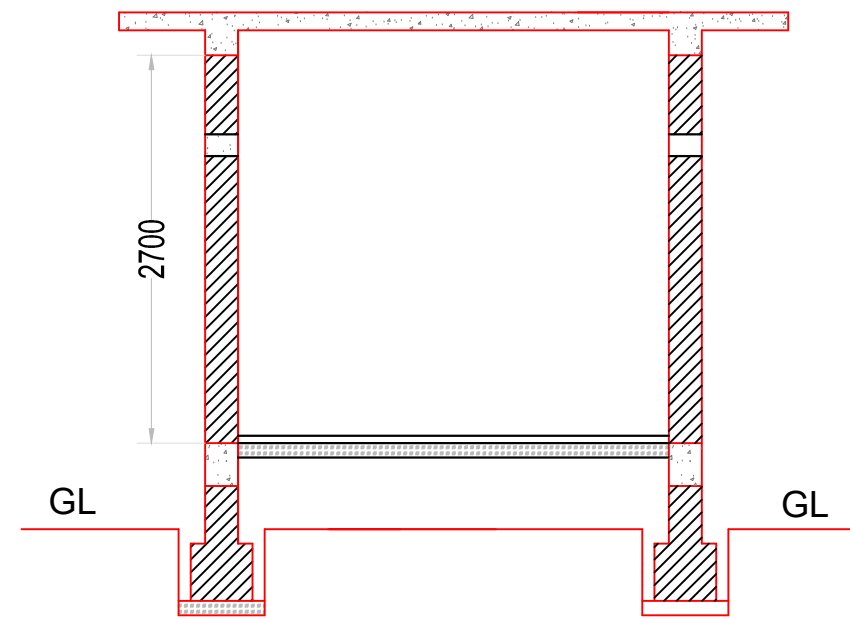
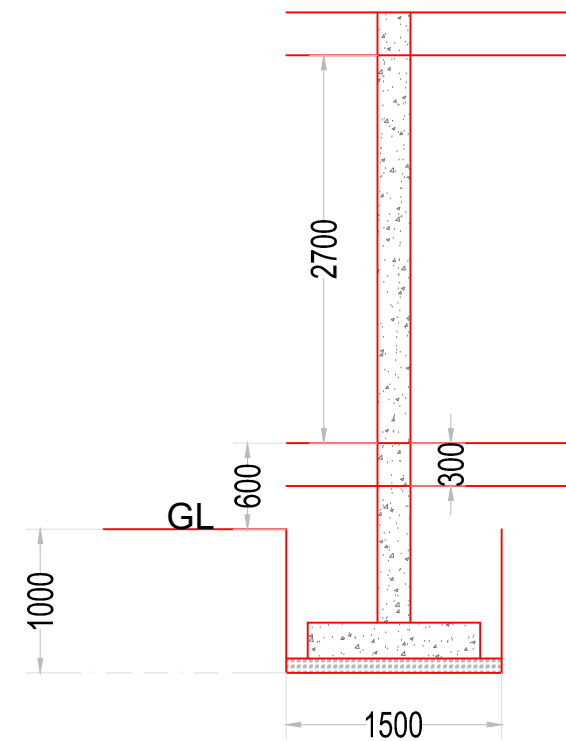


WICKET GATE



BOUNDARY WALL 67.6RMt.  
COLUMN 5.29 RMt.  
BKM  
(67.6-5.29)-6 MT GATE =56.3 MT.

DEPARTMENT:	MJP
PROJECT:	5 KLD FSTP
NOTE: 1.ALL DIMENSIONS & LEVEL ARE IN MILLIMETERS 2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. 3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.	
AREA STATMENT	
TOTAL AREA	25 Mt.X13.6 Mt.
AREA OF PLANT	15.5 Mt.X7.6 Mt.
BOUNDRY WALL	61.6 RMt.
MAIN GATE	5.0 RMt.
WICKET GATE	1.0 RMt.
OPERETOR ROOM	4.0Mt.X3.0Mt.
INDEX	
REINFORCED CEMENT CON.	
PLAIN CEMENT CONCRETE	
BRICK MASONRY.	
DRAWING TITLE:	<input type="checkbox"/> KLD FSTP <input type="checkbox"/> NDAR <input type="checkbox"/> WALL CIVIL GA DRAWING
DRAWING NO.:	SHEET NO.:
DDB/PRO/GA-01	01A/03
DATE:	SCALE:
19.02.2021	1:100
CONTRACTOR	



DEPARTMENT:

MJP

PROJECT:
----------

5 KLD FSTP

NOTE:  
1.ALL DIMENSIONS & LEVEL ARE IN MILIMETERS  
2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.  
3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.

## AREA STATEMENT

<u>TOTAL AREA</u>	25 Mt.X13.6 Mt.
-------------------	-----------------

AREA OF PLANT 15.5 Mt.X7.6 Mt.

BOUNDARY WALL	<u>71.5 RMt.</u>
---------------	------------------

MAIN GATE	<u>4.5 RMt.</u>
-----------	-----------------

WICKET GATE	1.2 RMt.
-------------	----------

OPERETOR ROOM 4.0Mt.X3.0Mt.

INDEX

 REINFORCED CEMENT CON. PLAIN CEMENT CONCRETE BRICK MASONARY.

DRAWING TITLE:  
**0 KLD FSTP GA RD**  
**R M T I CIVIL GA**  
**DRAWING**

DRAWING NO.:	SHEET NO.:
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DDB/PRO/GA-01

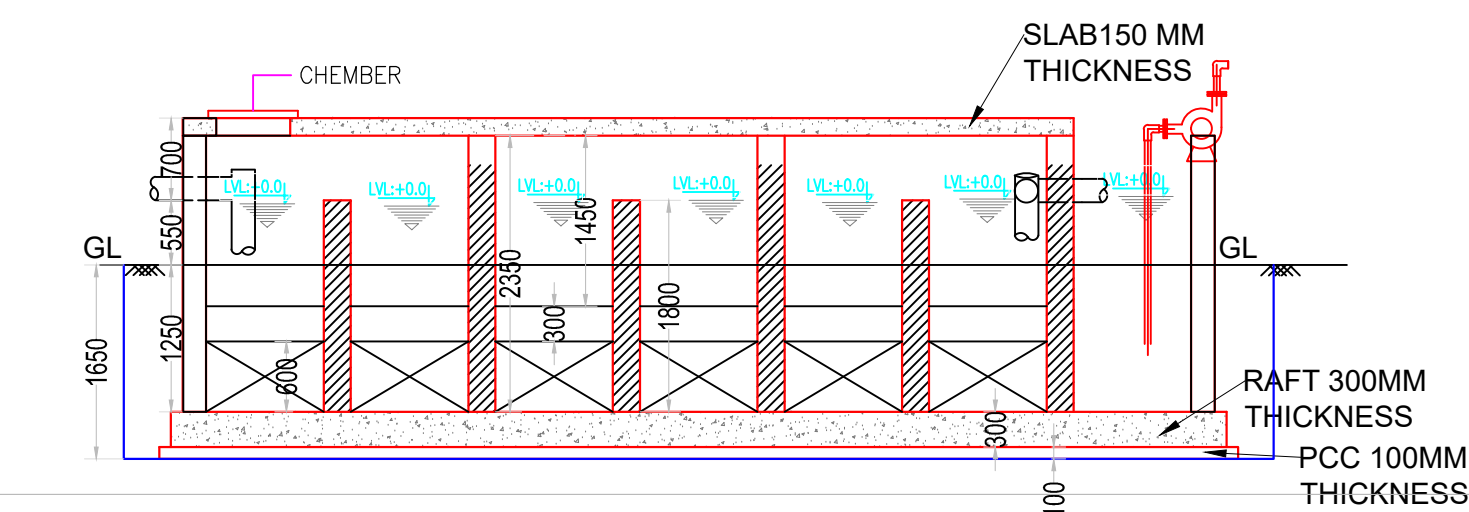
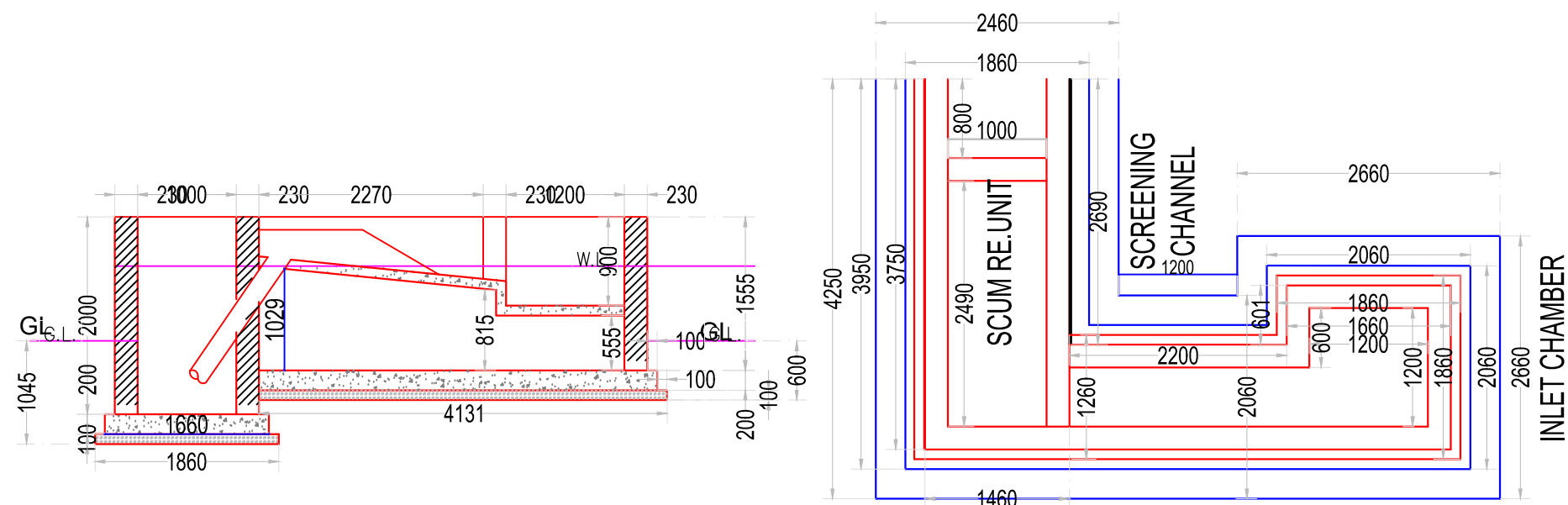
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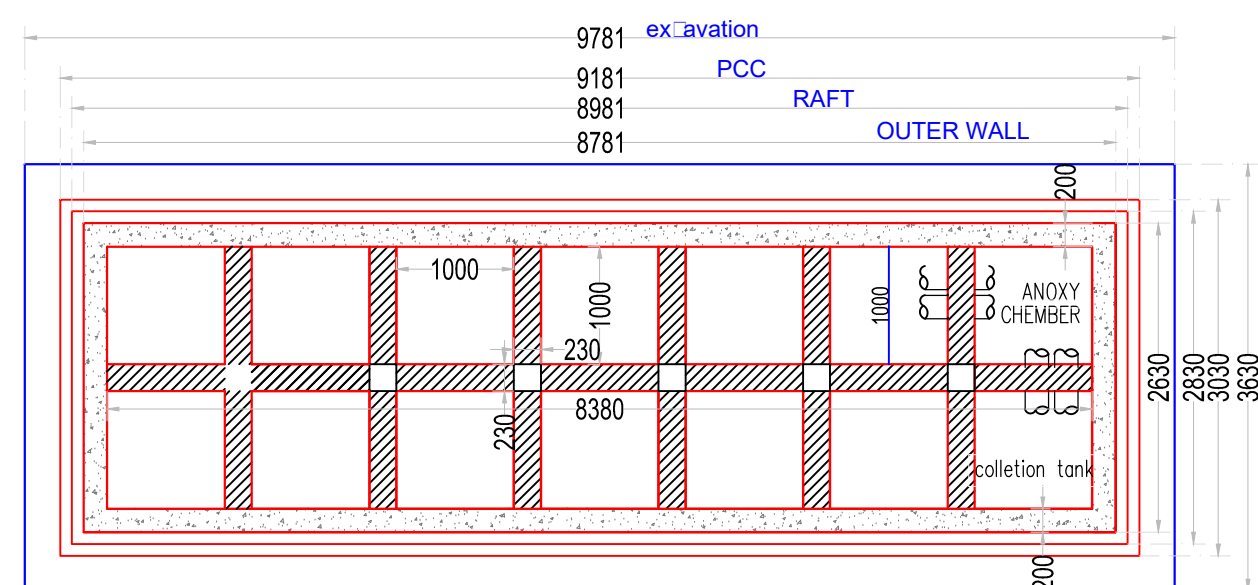
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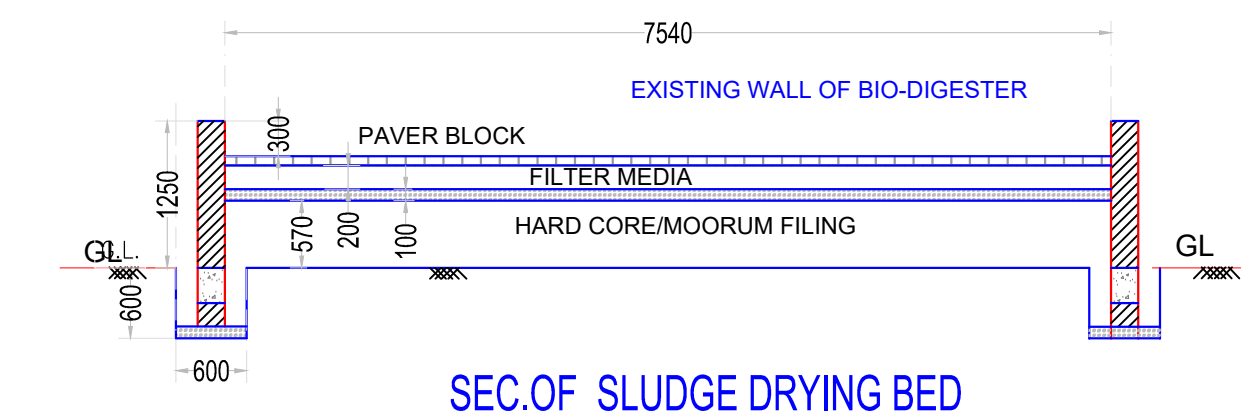
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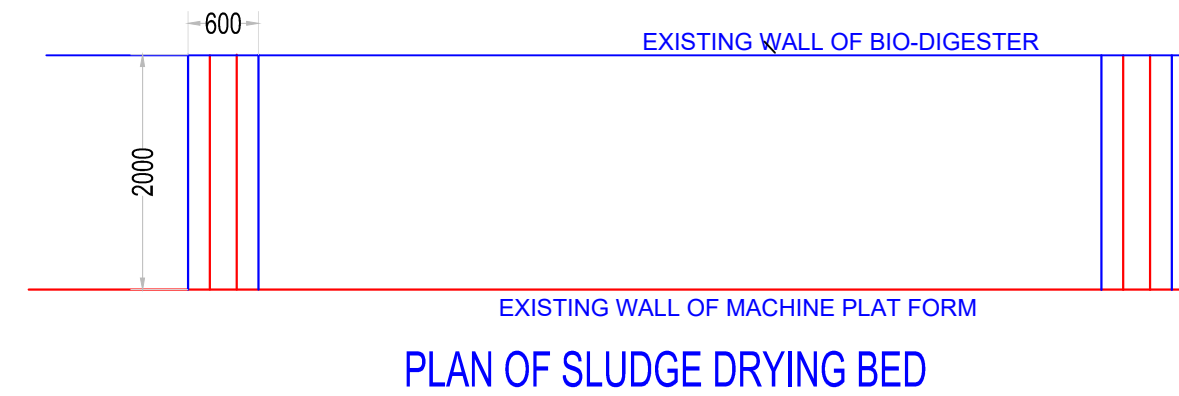
SECTION AT X1-X1



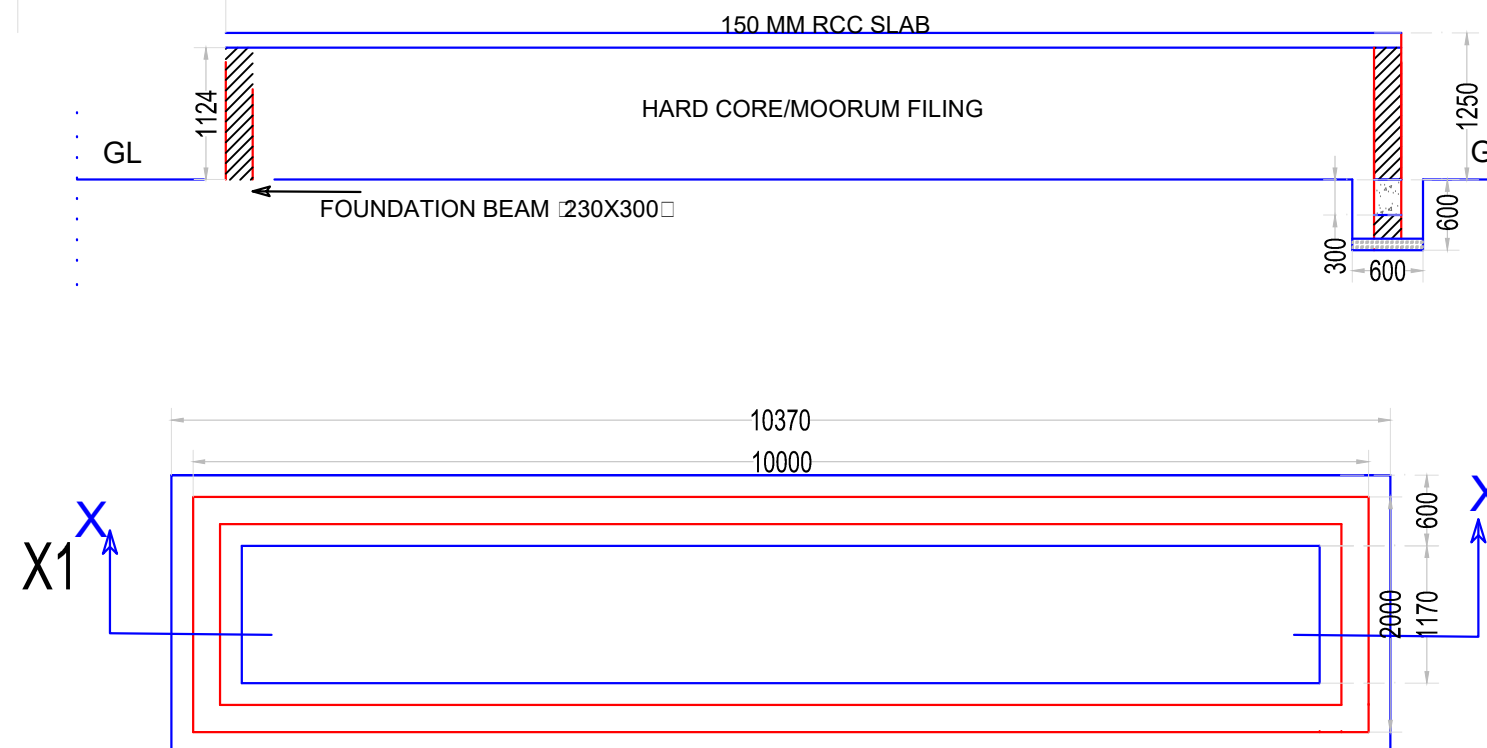
FOUNDATION PLAN FOR BIODIGESTER.



SEC.OF SLUDGE DRYING BED



PLAN OF SLUDGE DRYING BED



MACHINE PLATFORM

DEPARTMENT:

MJP

PROJECT:

5 KLD FSTP

NOTE:  
1.ALL DIMENSIONS & LEVEL ARE IN MILIMETERS  
2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.  
3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.

### AREA STATMENT

TOTAL AREA 25 Mt.X13.6 Mt.

AREA OF PLANT 15.5 Mt.X7.6 Mt.

BOUNDRY WALL 71.5 Rmt.

MAIN GATE 4.5 Rmt.

WICKET GATE 1.2 Rmt.

OPERETOR ROOM 4.0Mt.X3.0Mt.

INDEX

REINFORCED CEMENT CON.

PLAIN CEMENT CONCRETE

BRICK MASONARY.

DRAWING TITLE:

0 KLD FSTP FOUNDATION CIVIL GA DRAWING

DRAWING NO.:

DDB/PRO/GA-01

DATE:

19.02.2021

SHEET NO.:

01A-01

SCALE:

1:100

CONTRACTOR



SECTION AT X2-X2

SECTION AT X1-X1

SECTION AT GUARD  
ROOM

SECTION AT X3-X3

## PLAN OF INLET CHAMBER/SCREENING AND SCUM REMOVAL UNIT

SECTION AT X4-X4

SECTION AT X5-X5




## SECTION OF BIO-DIGESTER

DEPARTMENT:  
MJP

PROJECT:  
5 KLD FSTP

NOTE:  
1.ALL DIMENSIONS & LEVEL ARE IN MILIMETERS  
2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.  
3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.

AREA STATMENT	
<u>TOTAL AREA</u>	<u>21.0 Mt.X12.8 Mt.</u>
<u>AREA OF PLANT</u>	<u>12.5 Mt.X6.6 Mt.</u>
<u>BOUNDRY WALL</u>	<u>60.8 RMt.</u>
<u>MAIN GATE</u>	<u>5.00 RMt.</u>
<u>WICKET GATE</u>	<u>1.00 RMt.</u>
<u>OPERETOR ROOM</u>	<u>4.0X3.0</u>

INDEX	
	REINFORCED CEMENT CON.
	PLAIN CEMENT CONCRETE
	BRICK MASONRY.

DRAWING TITLE:  <b>□ KLD FSTP CIVIL GA DRAWING</b>	
DRAWING NO.:  DDB/PRO/GA-01	SHEET NO.:  01A
DATE:  19.02.2021	SCALE:  1:100



ESTIMATE FOR 10 KLD FSTP							
MEASUREMENT SHEET							
S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
PART 1 FSTP							
<b>(1):- EXCAVATION WORKS</b>							
1	BIO-DIGESTER	1	12.75	4.63	1.85	109.21	M³
2	SLUDGE DRYING BED FOUNDATION	2	2.00	0.60	0.60	1.44	M³
3	MACHINE PLATFORM long span	2	10.37	0.60	0.60	7.47	M³
4	MACHINE PLATFORM short span	2	1.17	0.60	0.60	0.84	M³
5	SCUM REMOVAL CHAMBER	1	4.25	2.46	1.05	10.98	M³
6	SCREENING CHAMBER	1	1.20	2.06	0.60	1.48	M³
7	GRIT CHAMBER/INLET	1	2.66	2.66	0.60	4.25	M³
					<b>Total:-</b>	<b>135.67</b>	
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	BIO-DIGESTER PCC	1	12.20	4.03	0.10	4.92	M³
2	SLUDGE DRYING BED BASE PCC	1	7.54	2.00	0.10	1.51	M³
3	BELOW SIDE WALL PCC	2	2.00	0.60	0.10	0.24	M³
4	MACHINE PLAT FROM FOUNDATION WALL PCC long span	2	10.37	0.60	0.10	1.24	M³
5	MACHINE PLAT FROM FOUNDATION WALL PCC short span	2	1.17	0.60	0.10	0.14	M³
6	SCUM REMOVAL CHAMBER	1	3.96	1.86	0.10	0.74	M³
7	SCREENING CHAMBER	1	1.20	1.46	0.10	0.18	M³
8	GRIT CHAMBER/INLET	1	2.06	2.06	0.10	0.42	M³
9	AROUND THE PEVERS BLOCKS OF PAVMENT	1	45.356	0.3	0.10	1.36	M³
10	BASE CONC.IN TRUCK PARKING	1	13.1	4.66	0.10	6.10	M³
					<b>Total:-</b>	<b>16.85</b>	
<b>(3) :- REINFORCEMENT CONCRETE WORKS RAFT (Grade :-M30)</b>							
1	RAFT(30) FOR BIO-DIGESTER	1	11.98	3.83	0.30	13.77	M³
2	RAFT (M30) FRO SC UM REMOVAL CHAMBER	1	3.86	1.66	0.20	1.28	M³
3	RAFT (M30) FOR SCREENING CHAMBER	1	2.10	1.26	0.20	0.53	M³
4	RAFT (M30) GRIT CHAMBER	1	1.86	1.86	0.20	0.69	M³
					<b>Total:-</b>	<b>16.27</b>	
<b>(4) :- REINFORCEMENT CONCRETE WORKS FOR BEAM(Grade :-M30)</b>							
1	SLUDGE DRYING BED SIDE BEAM	2	2.20	0.23	0.23	0.23	M³
2	BEAM PARTITION CENTER WALL	1	10.30	0.23	0.30	0.71	M³
3	FOUNDATION BEAM IN MACHINE PLAT FORM LONG SPAN	2	10.00	0.23	0.30	1.38	
	BEAM IN MACHINE PLAT FORM SHORT SPAN	2	1.54	0.23	0.30	0.21	
					<b>TOTAL</b>	<b>2.54</b>	
<b>(5) :- REINFORCEMENT CONCRETE WORKS FOR COLUMN (Grade :-M30)</b>							
1	COLUMN (M300)	6	0.23	0.23	2.30	0.73	M³
					<b>TOTAL</b>	<b>0.73</b>	
<b>(6) :- REINFORCEMENT CONCRETE WORKS FOR Vertical Wall/SLAB (Grade :-M30)</b>							
1	BIO -DIGESTER LONG SPAN OUTER WALL	2	11.77	0.20	2.30	10.83	M³
2	BIO-DIGESTER SHORT SPAN OUTER WALL	2	3.23	0.20	2.30	2.97	M³
3	BOI-DIGESTER ANOXY CHAMBER PARTITION WALL	1	3.23	0.23	2.30	1.71	M³
4	BIO-DIGESTER SLAB	1	11.80	3.63	0.15	6.43	M³
5	MACHINE PLAT FORM SLAB	1	10.00	2.00	0.15	3.00	M³
					<b>TOTAL</b>	<b>24.93</b>	
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings, foundations,slabs, beams, columns, -----etc. complete.(including cost of binding wire) IS 1786, (Bd-F-17/306)</b>							
	TOTAL RCC QTY.=16.27+2.54+0.73+24.93 = 44.47					4.00	MT
	STEEL -90KG/CUM						
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	BIO-DIGESTER PARTION WALL(BUFFLE)	5	1.50	0.23	2.00	3.45	M³
2	BIO-DIGESTER RETURNING WALL	7	1.50	0.23	2.55	6.16	M³
3	BIO-DIGESTER CENTRE WALL	1	10.00	0.23	1.65	3.80	M³
4	MACHINE PLAT FORM FOUNDATION WALL long span	2	10.00	0.23	0.20	0.92	M³
5	MACHINE PLAT FORM FOUNDATION WALL short span	2	1.54	0.23	0.20	0.14	M³
6	MACHINE PLATFORM ABOVE GROUND LEVEL LONG WALL	2	10.00	0.23	1.12	5.15	M³
7	MACHINE PLATFORM ABOVE GROUND LEVEL SHORT WALL	2	1.54	0.23	1.12	0.79	M³

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
8	SLUDGE DRYING SHORT SPAN WALL	2	2.00	0.23	1.25	1.15	M³
9	SCUM REMOVAL CHAMBER LONG SPAN WALL	2	3.75	0.23	2.00	3.45	M³
10	SCUM REMOVAL SHORT SPAN WALL	2	1.00	0.23	2.00	0.92	M³
11	SCREENING CHAMBER LONG SPAN WALL	2	2.27	0.23	1.45	1.51	M³
12	GRIT CHAMBER LONG SPAN WALL	2	1.66	0.23	1.45	1.11	M³
13	GRIT CHAMBER SHORT SPAN WALL	1	1.20	0.23	1.45	0.40	M³
14	GRIT CHAMBER SHORT SPAN WALL	1	0.60	0.23	1.45	0.20	M³
					<b>Total:-</b>	<b>29.15</b>	
<b>(9) :- Hard Course/ MOORUM Filling Work</b>							
1	Sludge Drying Bed Hard course Filling (Moorum)	1	7.54	2.00	0.65	9.83	M³
2	Hard course Filling Machine Platform Foundation	1	9.54	1.60	1.10	16.79	M³
					<b>Total:-</b>	<b>26.62</b>	
<b>(10) :- Media Filter FOR SLUDGE DRYING BED</b>							
1	2 to 12 mm mix gravel filter media	1	7.54	2.00	0.20	3.02	M³
					<b>Total:-</b>	<b>3.02</b>	
<b>(11) :- Pavers Block Work</b>							
1	Pavers Blocks for sludge drying bed	1	7.54	2.00		15.08	M²
2	Pavers Blocks In front of Plant Long span	1	16.5	1		16.50	M²
3	Pavers Blocks In Left side of Plant Long span	1	7.62	1		7.62	M²
4	Pavers Blocks In back side of Plant Long span	1	14.8	1		14.80	M²
5	Pavers Blocks in side of screen & Scum chamber	1	4	5.8		23.20	M²
6	Pavers Blocks in side of screen & Scum chamber	1	2.2	2.7		5.94	M²
					<b>Total:-</b>	<b>83.14</b>	
<b>(12) :- PLASTERING IN BIO DIGESTER</b>							
1	Both side plastering in Bio-Digester chamber	10	1.50	2.00		30.00	M²
2	Both side plastering in Bio-Digester chamber	22	1.50	2.30		75.90	M²
3	Center wall plastering in Bio-Digester chamber	2	10.30	2.30		47.38	M²
4	Bio digester outer long wall plastering	2	11.80	2.30		54.28	M²
5	plaster in scum removal outer	1	3.75	2.00		7.50	M²
		1	2.69	2.00		5.38	M²
		1	1.46	2.00		2.92	M²
6	plaster in scum removal inner	2	3.30	2.00		13.20	M²
		4	1.00	2.00		8.00	M²
7	screening outer	2	2.20	1.55		6.82	M²
	screening inner	2	2.43	1.55		7.53	M²
8	grit chamber outer	3	1.66	1.55		7.72	M²
		1	0.60	1.55		0.93	M²
	grit chamber inner	3	1.20	0.90		3.24	M²
		1	0.60	0.90		0.54	M²
					<b>Total:-</b>	<b>207.56</b>	M²
<b>PART 2) GAURD ROOM ,TOILET,BOUNDARY WALL</b>							
<b>(1) :- Excavation For Guard Room Foundation/Piling</b>							
1	footing Excavation	6	1.50	1.50	1.00	13.50	M³
2	Excavation GUARD RM wall foundation long wall	2	2.80	0.60	0.60	2.02	M³
	Excavation GUARD RM wall foundation short wall	2	1.80	0.60	0.60	1.30	M³
	Excavation TOI. wall foundation wall	1	0.80	0.60	0.60	0.29	M³
3	Excavation for column footing (C1 type)	2	1.50	1.50	1.00	4.50	M³
4	Excavation for column footing (C2 type)	27	1.20	1.20	1.00	38.88	M³
5	Excavation below boundary wall	1	37.15	0.60	0.60	13.37	M³
					<b>Total:-</b>	<b>73.85</b>	M³
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	Column for guard rm& toilet	6	1.50	1.50	0.10	1.35	M³
2	Brick wall foundation PCC	1	20.00	0.40	0.10	0.80	M³
3	Guard Room Flooring PCC	1	3.00	4.00	0.05	0.60	M³
4	Toilet Flooring PCC	1	2.10	1.20	0.05	0.13	M³
5	Urine Pot Flooring PCC	1	1.70	0.70	0.05	0.06	M³
6	PCC for boundary wall column footing (C1 type)	2	1.50	1.50	0.10	0.45	M³
7	PCC for boundary wall column footing (C2 type)	27	1.20	1.20	0.10	3.89	M³
8	PCC below boundary wall	1	37.15	0.60	0.10	2.23	M³

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
					Total:-	9.50	
<b>(3) Footing</b>							
1	column footing raft for GUARD RM& TOI. (M20)	6	1.20	1.20	0.25	2.16	M³
2	RAFT for boundary wall column footing (C1 type)	2	1.20	1.20	0.25	0.72	M³
3	RAFT for boundary wall column footing (C2 type)	27	1.00	1.00	0.25	6.75	M³
					Total:-	9.63	M³
<b>(4) Column</b>							
1	GUARD RM& TOI. Column (M20)	6	0.23	0.23	4.25	1.35	M³
2	boundary wall column(C1 type)	2	0.40	0.40	1.60	0.51	M³
3	boundary wall column (C2 type)	27	0.23	0.23	1.92	2.74	M³
					Total:-	4.60	M³
<b>(5) Beam &amp; lintal beam (M20)</b>							
1	Slab beam long span	2	4.46	0.23	0.20	0.41	M³
2	Slab beam short span	2	3.00	0.23	0.20	0.28	M³
3	Toilet Slab Beam Long span slab beam	1	2.60	0.23	0.30	0.18	M³
4	Toilet Slab Beam Short span slab beam	2	1.20	0.23	0.30	0.17	M³
5	Plinth Beam long span	2	4.00	0.23	0.30	0.55	M³
6	Plinth Beam short span	2	3.00	0.23	0.30	0.41	M³
7	Lintel beam above door	2	3.60	0.23	0.23	0.38	M³
8	Lintel beam above window	2	1.50	0.23	0.23	0.16	M³
9	Toilet Long span plinth beam	1	2.60	0.23	0.30	0.18	M³
10	Toilet Short span plinth beam	2	1.20	0.23	0.30	0.17	M³
11	BOUNDARY WALL PLINTH BEAM	1	63.89	0.23	0.23	3.38	M³
					Total:-	6.26	M³
<b>(6) RCC WALL &amp; SLAB (M20)</b>							
1	Guard room	1	4.66	3.66	0.13	2.13	M³
2	Toilet Short span wall	1	2.66	1.45	0.13	0.48	M³
					Total:-	2.61	M³
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings,</b>							
	TOTAL RCC QTY.=9.63+4.60+6.26+2.61=23.11					2.08	MT
	STEEL -90KG/CUM						
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	guard room long wall	2	4.00	0.23	3.30	6.07	M³
2	guard room long wall	2	3.00	0.23	3.30	4.55	M³
3	Toilet long wall	1	2.56	0.23	3.30	1.94	M³
4	Toilet Short wall	1	1.05	0.23	3.30	0.80	M³
5	BOUNDARY WALL	1	63.89	0.23	1.67	24.54	M³
					Total:-	37.91	M³
<b>(9) :- PLASTERING WORKS</b>							
1	Plastring long wall (Inner)	2	4.00		3.00	24.00	M²
2	Plastring short wall (Inner)	2	3.00		3.00	18.00	M²
3	Plastring Ceiling	1	4.00	3.00		12.00	M²
4	Plastring long wall (Outer)	2	4.46		3.73	33.23	M²
5	Plastring short wall (Outer)	2	3.46		3.73	25.78	M²
6	Plastring toilet (Inner)	2	2.10		3.00	12.60	M²
7	Plastring toilet (Inner)	2	1.05		3.00	6.30	M²
8	Plastring toilet CEILING (Inner)	1	2.10	1.05		2.21	M²
9	Plastring long wall (Outer)	1	2.56		3.73	9.55	M²
10	Plastring short wall (Outer)	1	1.45		3.73	5.41	M²
11	Plastring boundry wall at Inner side	1	70.43		1.67	117.62	M²
12	Plastring boundry wall at outer side	1	71.58		1.67	119.54	M²
					Total:-	386.22	M²
<b>10) Painting/Colouring Work for Guard Room</b>							
	As per item no.9					386.22	M²
<b>11) Guard Room Door</b>							
	Toilet Door	1	1.07		1.83	1.95	M²
		1	0.76		1.83	1.39	M²

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)		Unit
						QTY	
		Total:-				3.34	M²
12)	Window	2	0.90		0.90	1.62	M²
13)	VENTILATOR	2	0.45		0.45	0.41	M²
14)	Guard Room Plinth filling	1.00	4.00	3.00	0.60	7.20	M³
	Toilet Plinth filling	1.00	2.10	1.05	0.60	1.32	M³
		Total:-				8.52	M³
	OTHERS						
1)	MS gate						
	Main Gate	2	2.50			2.00	no
	WICKET Gate	1	1.00			1.00	no.
2)	W.C. PAN	1	Nos				
3)	Wash Basin	1	Nos				
4)	Urin Pot	2	Nos				
5)	UPVC PIPE 4" dia	6	mt				
6)	Electric Fan	1	Nos				
7)	LED BULB 100 WATT	4	Nos				
8)	Bulb Holders	4	Nos				
9)	Electric wire	20	MT				
10)	PVC pipe for electric fitting	10	MT				
11)	Power switch Board	2	Nos				

DESIGN OF 10 KLD CAPACITY STP			
Capacity of STP	10	KLD	
Values adopted from CPHEEO manual on sewage treatment plant November 2013 Chapter 9 table 9.13 page 9-43			
Parameter	Value	Parameter	Value
Quantity of effluent	10	KLD	
Colour	10	M3/day	
Odour	Unobjectionable		
Temperature	18°C-27°C		
pH	5.5-9.0		
Total Solid	40000.0	Mg/L	
Total dissolved Solid	25000.0	Mg/L	
Suspended Solid	15000.0	Mg/L	
Volatile Solid	10000.0	Mg/L	
Total BOD <sub>20</sub> °C	100	Mg/L	
COD	2000	Mg/L	
Oil & Grease	6000	Mg/L	
Total Nitrogen (TKN)	700	Mg/L	
N-NH <sub>4</sub>	150.00	Mg/L	
Org-N	550.00	Mg/L	
N-NO <sub>3</sub>	-	Mg/L	
Total P	250	Mg/L	
Alkalinity	-	Mg/L	
Total Coliform	100000	Mpn/100 ml	
Minimum values have been adopted between discharge standard into inland surface water and that for and land for irrigation			
TREATED SEWAGE QUALITY			
Parameter	Value	Parameter	Value
BOD <sub>20</sub> °C	≤10	Mg/L	
Total Suspended Solid	≤100	Mg/L	
COD	≤50	Mg/L	
As	≤10	Mg/L	
Cd	≤5	Mg/L	
Cr	≤50	Mg/L	
Cu	≤300	Mg/L	
Pb	≤100	Mg/L	
Hg	≤0.15	Mg/L	
Ni	≤50	Mg/L	
Mn	≤1000	Mg/L	
C/N Ratio	20-40		
Total Coliform	≤1000	MPN/100ml	
Quantity of Sewage Generated	10000.00	Lpd	
	10.00	KLD	
	10.00	Cum/day	
Raw Sewage Characteristics			
1 Average Sewage flow entering the treatment plant	10000.00	Lpd	
Assumed Pea Factor	1.00		DEWATS
2 Pea Sewage flow entering the treatment plant	10000.00	Lpd	
3 COD	25000.00	mg/Lt	
4 BOD	6500.00	mg/Lt	
5 TDS	15200.00	mg/Lt	
6 TSS	15000.00	mg/Lt	
7 pH	4.5 to 11.5		
Inlet Characteristics of GRIT Chamber			
Number of Unit	1	no	
total collection time feeding hour	8	hour	
Quantity of Flow Ave	3000 li per hour	be cause collecting from pool vehicle	
	0.05	Cum/minute	

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DESIGN OF 0 KLD CAPACITY STP				
	Capacity of Aeration Tank	0	KLD	
1. M				
No. of tanks	1			Refer to the design
Computation of Settling Velocity, Stokes Law				
Kinematic Viscosity of effluent assumed	0.0000011	m <sup>2</sup> /sec		
Particle Diameter assumed	0.000150	m		
Settling Velocity	0.02	m/sec		Pg.208,209 of CPHEEO manual
Reynold's number, Re <sub>v</sub> = V <sub>s</sub> ρ/μ	2.73			
For Transition flow, V <sub>s</sub> = 0.707 S <sub>0</sub> <sup>1.6</sup> V <sub>0.6</sub> <sup>-0.714</sup>	0.02	m/sec		Pg.208,209 of CPHEEO manual
Actual Settling velocity	0.02	m/sec		Pg.208,209 of CPHEEO manual
Removal efficiency	491.36	um/m/d		
Assumed Removal Efficiency	75.00	%		
	368.52	um/m/d		
Actual Surface Overflow Rate : Q/A V <sub>0</sub> / [(1-η) <sup>-0.125</sup> - 1]	974	um/m/d		Pg 209-table n.125, as per table 11.1-it is 1555
D				
P	0.00	m <sup>2</sup>		
Total Plan area of Grit channel = P/A	0.01	m <sup>2</sup>		
Assumed width of Grit channel	0.00	m		
Assumed depth of Grit channel	0.00	m		
Liquid Depth assumed	1.50	m		
Provide a depth for the Grit Storage	0.30	m		
Provide the D of the tank as M of the tank as SWD of 0.00 Fr				
r of the tank as M of the tank as SWD of 0.00 Fr				
D R	0			
C D R	0			
D R	0.00	mg/Lt		
C D R	15000.00	mg/Lt		
2. r				
Peak Design Flow	10.00	Cum/day		
Assumed Detention period	96	hour		
Volume of the Tank	40	Cum		
Assumed Depth of Liquid Column	2	m		
Area required for the equalization tank	20	Sq.m		
No. of Tanks Proposed	12			
area required for each equalization tank	1.666666667	Sq.m		
Length to Breadth ratio	1			
Breadth of the tank	1.5	m		
Length of the tank	1.5	m		
Provide the D of the tank as M of the tank as SWD of 2 N of 0.00 Fr				
r of the tank as M of the tank as SWD of 2 N of 0.00 Fr				

DESIGN OF 0 KLD CAPACITY STP			
CONSTRUCTED AREA FOR FLOW		Q	KLD
<p>Design of the STP is based on the following data and assumptions:</p> <p>1. The design flow is 0 KLD.</p> <p>2. The design period is 2 years.</p> <p>3. The design velocity is 0.3 m/s.</p> <p>4. The design depth is 2.0 m.</p> <p>5. The design area is 0.00 m².</p> <p>6. The design length is 0.00 m.</p> <p>7. The design breadth is 0.00 m.</p> <p>8. The design length to breadth ratio is 1.0.</p> <p>9. The design breadth of the tank is 0.5 m.</p> <p>10. The design length of the tank is 0.5 m.</p>			
DESIGN FLOW		0	0
DESIGN AREA		0	0
DESIGN LENGTH		0.00	mg/Lt
DESIGN BREADTH		0.00	mg/Lt
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
DESIGN LENGTH TO BREADTH RATIO		1.0	
DESIGN BREADTH OF THE TANK		0.5	
DESIGN LENGTH OF THE TANK		0.5	
DESIGN AREA OF THE TANK		0.25	
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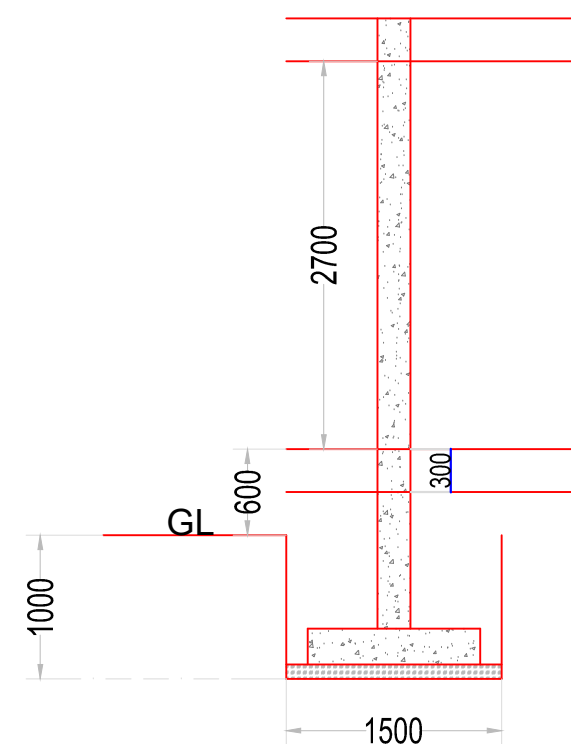


DESIGN OF 0 KLD CAPACITY STP			
Calculation	0	KLD	
<b>Primary and First Stage</b>			
Ave. Influent BOD, $S_0$	175.5	g/m <sup>3</sup>	
Estimated Effl. BOD, $S_e$	35	g/m <sup>3</sup>	
Design Value of BOD Surface			
Area Loading Rate (SALR)	15	g/m <sup>2</sup> /d	
<b>Primary and Second Stage</b>			
Target Effluent BOD, $S_2$	7	g/m <sup>3</sup>	
Estimated Infl. BOD, $S_2$	35	g/m <sup>3</sup>	
Design Value of BOD Surface			
Area Loading Rate (SALR)	5	g/m <sup>2</sup> /d	
Carrier Sp. Surface Area	396	m <sup>2</sup> /m <sup>3</sup>	
Carrier Sp. Wt.	20	g/m <sup>3</sup>	
Liquid Depth in Tank	2.20	m	
Tank L:W ratio	1.5		
Design Carrier Fill	40		
Carrier Void Space	60		
BOD Daily Loading		g/day	
	0	g/day	
Carrier Surface Area needed	93.7	m <sup>2</sup>	
Calculated Carrier Volume	0.237	m <sup>3</sup>	
Liquid Depth in Tank	2.2	m	
Calculated Tank Width	1.2	m	
Calculated Tank Length	2.1		
Calculated Tank Volume	5.5	m <sup>3</sup>	
<b>Secondary Stage</b>			
BOD Daily Loading	0	g/day	
	20	g/day	
Liquid Depth in Tank	2.2	m	
Calculated Tank Width	1.2	m	
Calculated Tank Length	1.5	m	
Calculated Tank Volume		m <sup>3</sup>	
<b>REDUCTION AFTER AERATION 1 AND AERATION 2</b>			
D R	0		
C D R	0		
D R		mg/Lt	
C D R	135.00	mg/Lt	
<b>Secondary Stage</b>			
D R	0		
C D R	0		
D R	02	mg/Lt	
C D R	27.00	mg/Lt	
<b>Primary and First Stage</b>			
<p>It is to be noted that the effluent from the primary and secondary stages is to be treated in the tertiary stage. The effluent from the tertiary stage is to be treated in the final stage. The effluent from the final stage is to be treated in the final stage.</p>			
<b>IV. Calculation of Area and Volume</b>			
O <sub>2</sub> needed per g BOD	2.00	g O <sub>2</sub> /g BOD	

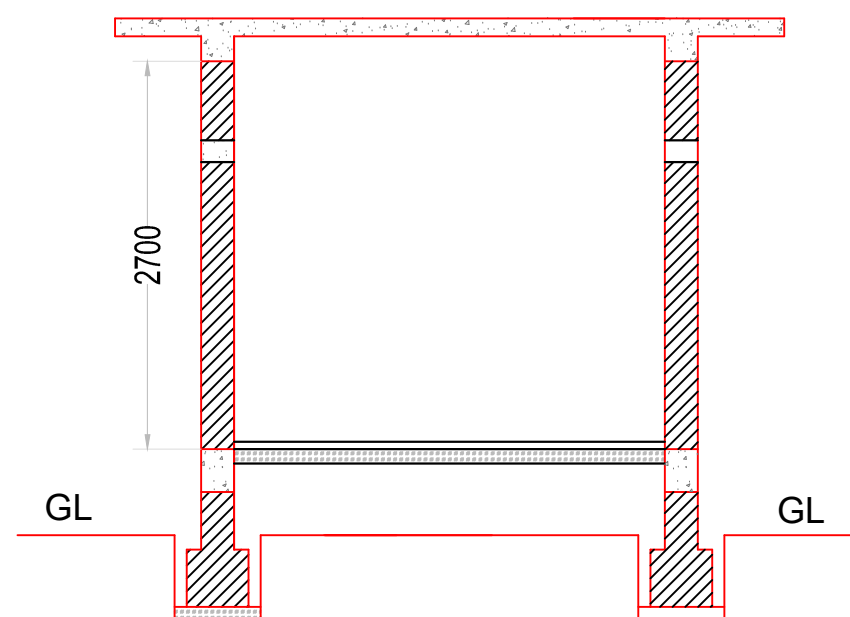
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DESIGN OF 0 KLD CAPACITY STP			
	Cumulative Area of Filter	0	KLD
Area of the Tank	0.28	Sqm	
Square tank Size	0.50	m	
FRP VESSEL 0"			
12	Pre-Filter Sand Filter		
Average Flow	10.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Time	1.25	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sqm	
Area of the Filter required	0.63	Sqm	
FRP VESSEL 0"			
13	Pre-Filter Sand Filter		
Average Flow	10.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Time	1.25	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sqm	
Area of the Filter required	0.63	Sqm	
FRP VESSEL 0"			
14	Effluent Discharge		
Discharge Rate	00		
Concentration	00		
Discharge Rate		mg/Lt	
Concentration	22.95	mg/Lt	
15	Filter and Pump		
Pre-Filter and Sand Filter	2	Cum/hr	
	00		
15	Discharge in Line		
Discharge Rate	20.00		
Concentration	20.00		
Discharge Rate		mg/Lt	
Concentration	18.36	mg/Lt	
16	TREATED WATER TANK		
Total Quantity of Effluent	10.00	CUM	
TOTAL LOSS IN PROCESS	15.0		
TOTAL TREATED WATER	8.5	CUM	

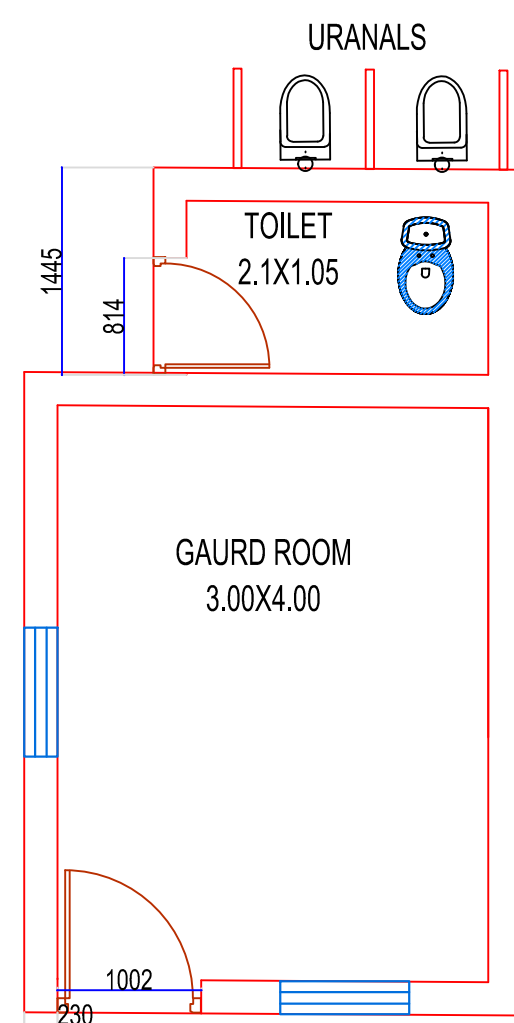
DESIGN OF 0 KLD CAPACITY FSTP				
	Cumulative Area of Floor	0	KLD	
Peak Design Flow		8.50	Cum/day	
Assumed Detention period		2	hour	
Volume of the Tank		2.125	Cum	
Assumed Depth of Liquid Column		2	m	
Area required for the tank		1.0625	Sq.m	
No. of Tanks Proposed		1		
area required for each tank		1.0625	Sq.m	
Length to Breadth ratio		1		
Breadth of the tank		1.5	m	
Length of the tank		1.5	m	



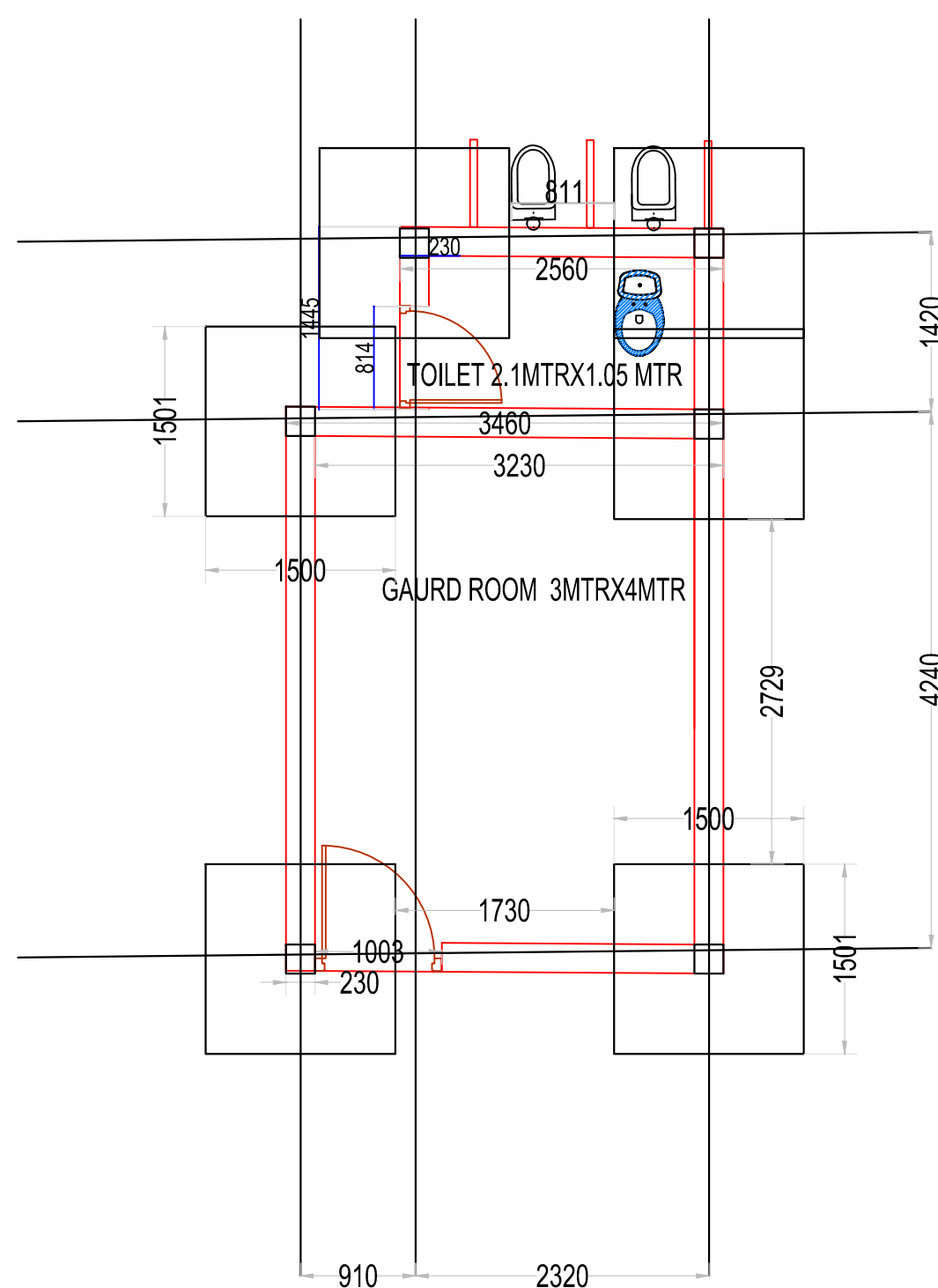
DETAIL OF CLOUMN



SECTION OF GAURD ROOM



PLAN OF GAURD ROOM&TOILET



CENTRE LINE PLAN OF GAURD ROOM&TOILET

DEPARTMENT:

MJP

PROJECT:

10 KLD FSTP

NOTE:  
1.ALL DIMENSIONS & LEVEL ARE IN MILLIMETERS  
2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.  
3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.

### AREA STATMENT

TOTAL AREA 25 Mt.X13.6 Mt.

AREA OF PLANT 15.5 Mt.X7.6 Mt.

BOUNDRY WALL 71.5 RMt.

MAIN GATE 4.5 RMt.

WICKET GATE 1.2 RMt.

OPERETOR ROOM 4.0Mt.X3.0Mt.

### INDEX

REINFORCED CEMENT CON.

PLAIN CEMENT CONCRETE

BRICK MASONARY.

DRAWING TITLE:  
10 KLD FSTP GAURD ROOM & TOILET CIVIL GA  
DRAWING

DRAWING NO.: SHEET NO.:

DDB/PRO/GA-01

01B/02

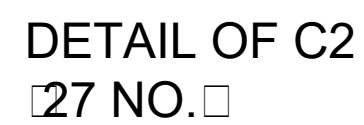
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19.02.2021


SCALE:

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CONTRACTOR



CONTRACTOR	7010212021
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DEPARTMENT:  
MJP




PROJECT:  
10 KLD FSTP

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AREA STATMENT

TOTAL AREA	25 Mt.X13.6 Mt.
AREA OF PLANT	15.5 Mt.X7.6 Mt.
BOUNDRY WALL	71.5 RMt.
MAIN GATE	4.5 RMt.
WICKET GATE	1.2 RMt.
OPERETOR ROOM	4.0Mt.X3.0Mt.

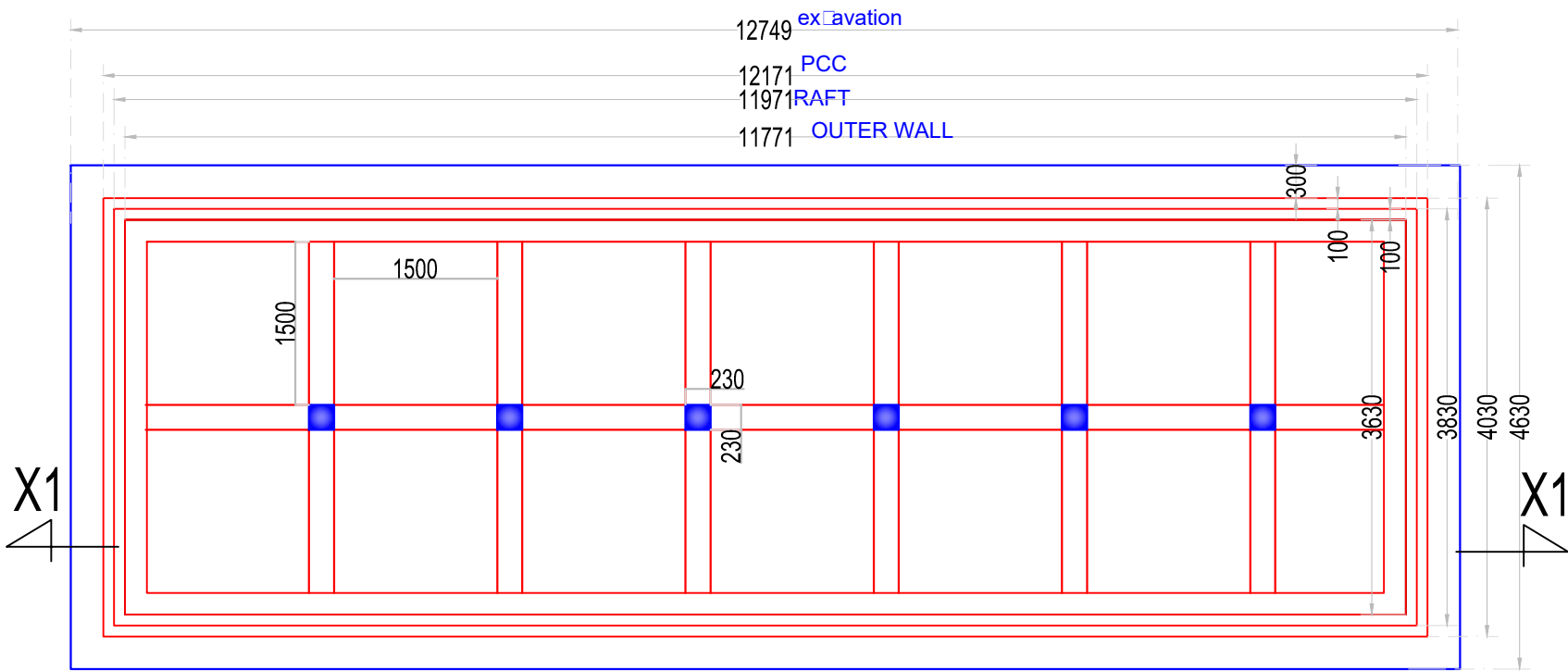
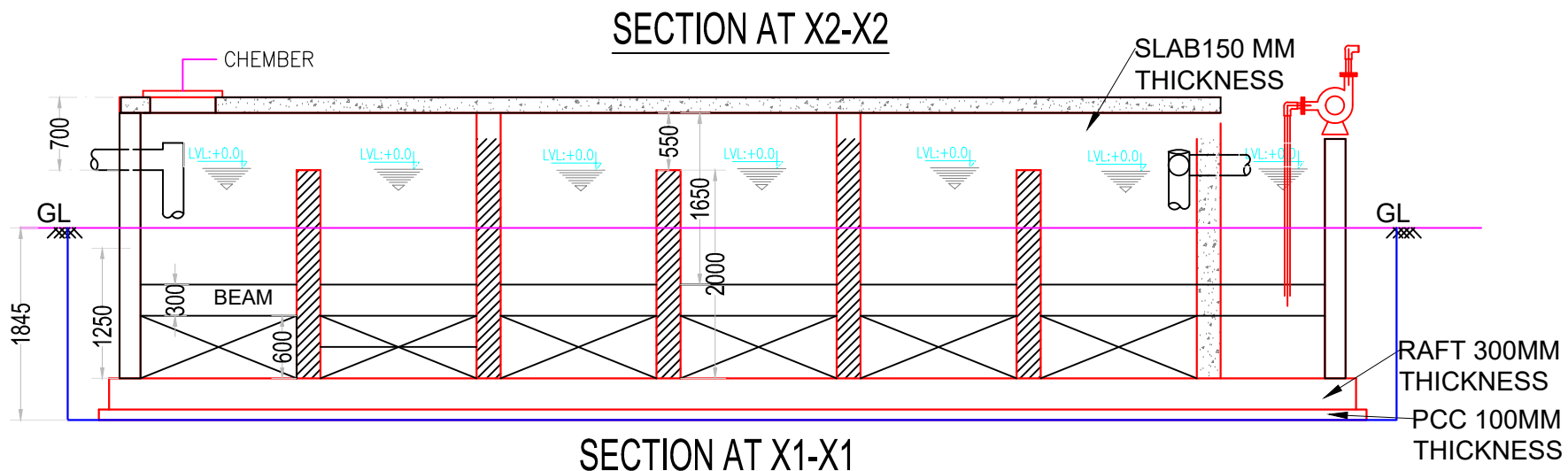
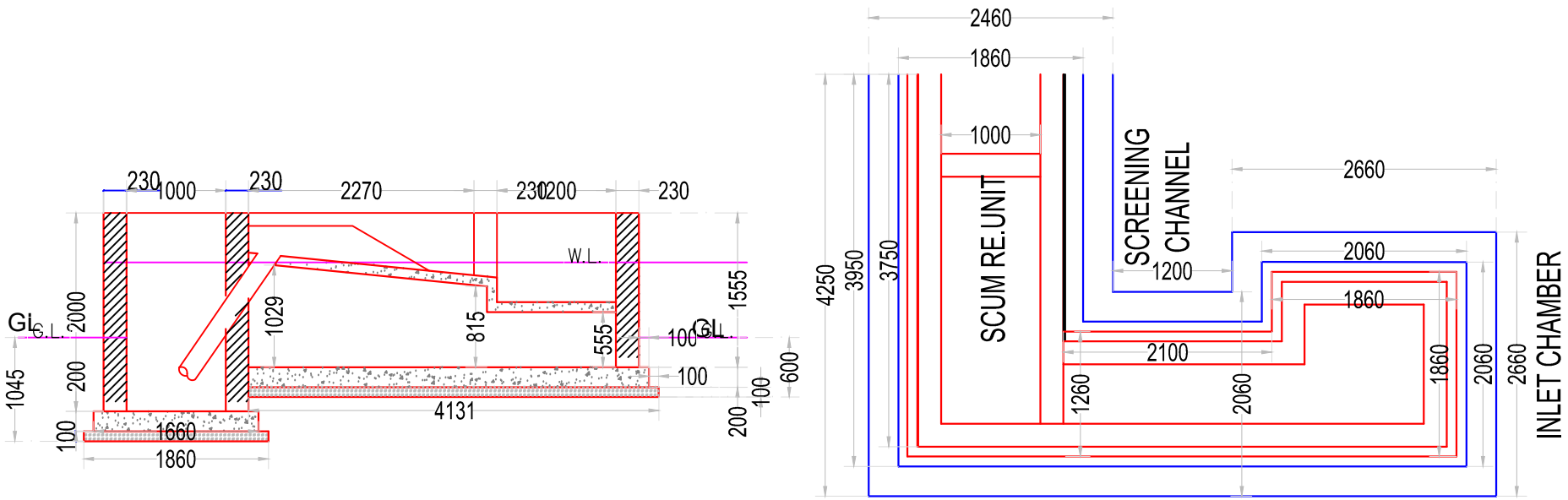
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	PLAIN CEMENT CONCRETE
	BRICK MASONARY.

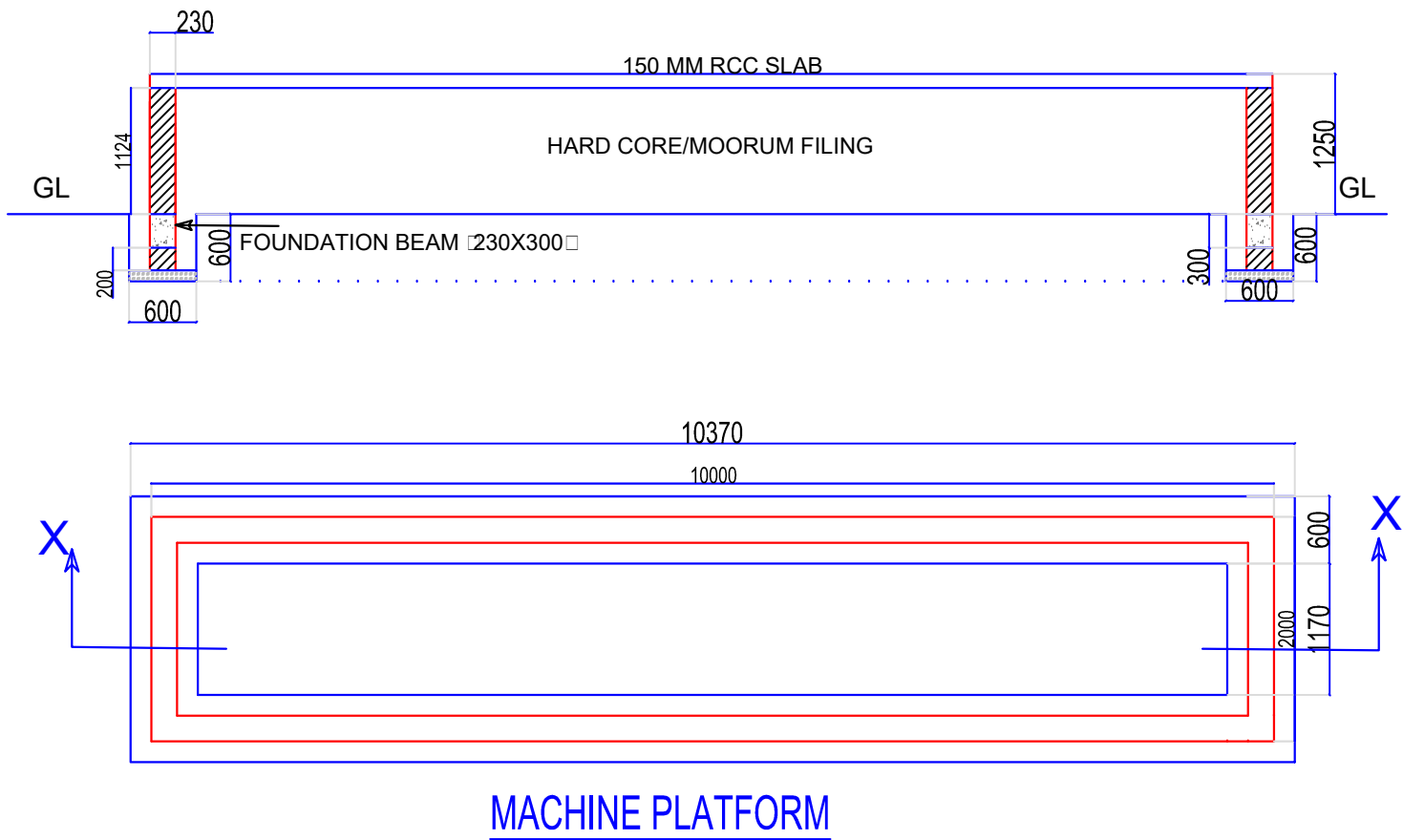
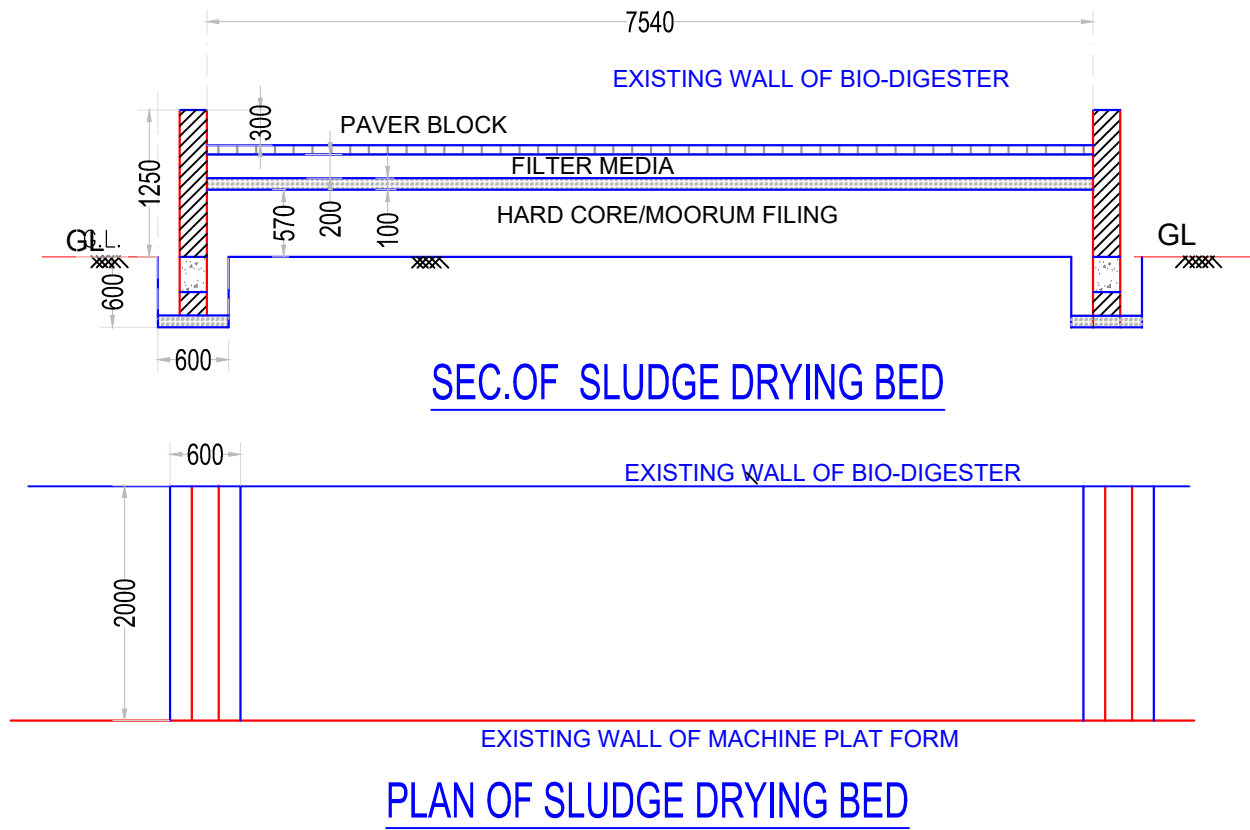
DRAWING TITLE:  
**10 KLD FSTP FOUNDATION CIVIL GA DRAWING**

DRAWING NO.:	SHEET NO.:
DDB/PRO/GA-01	01B/01
DATE:	SCALE:
19.02.2021	1:100

CONTRACTOR

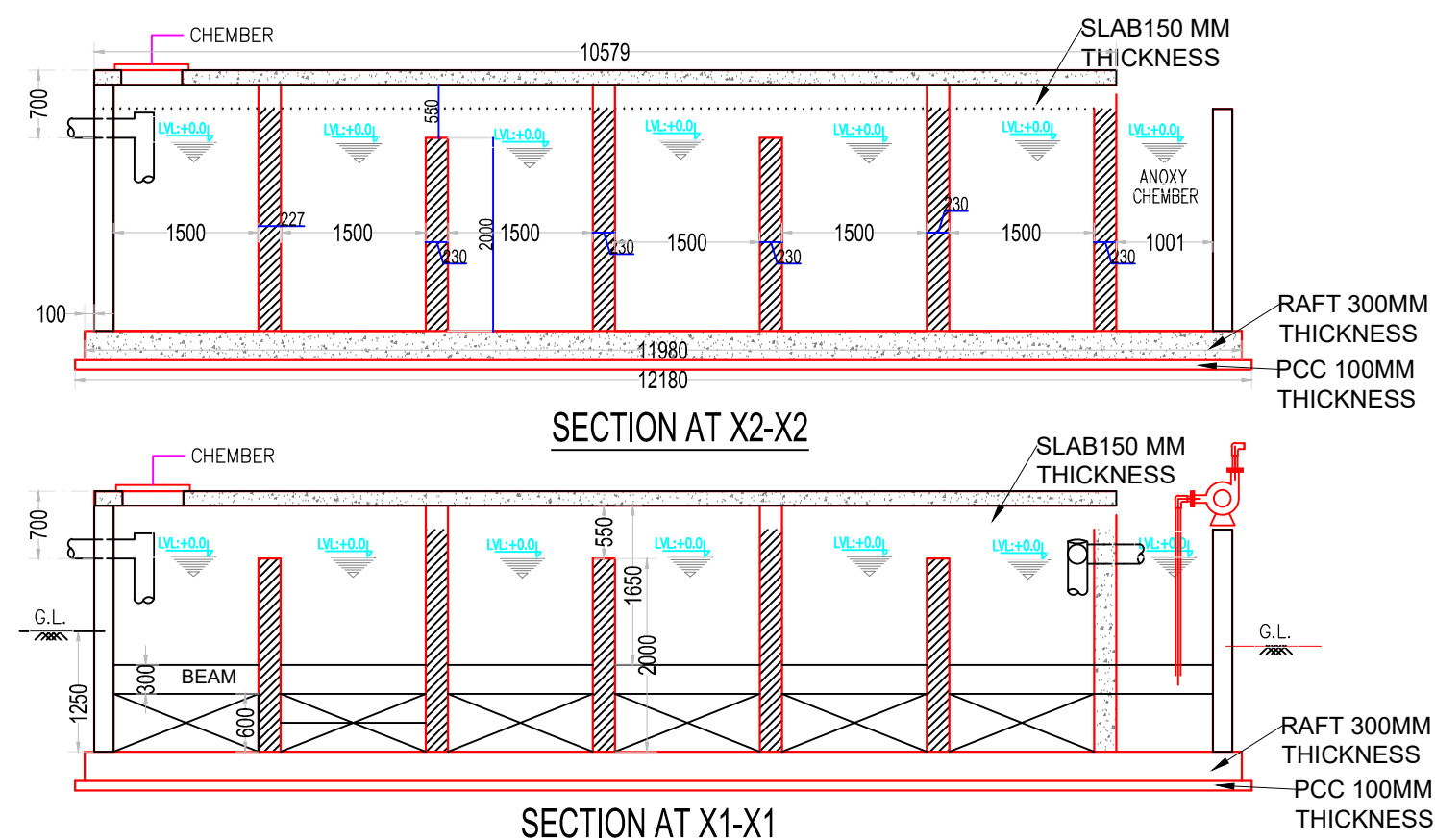


FOUNDATION PLAN FOR BIODIGESTER.

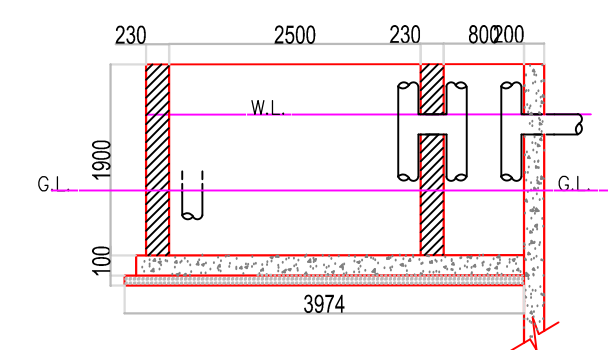
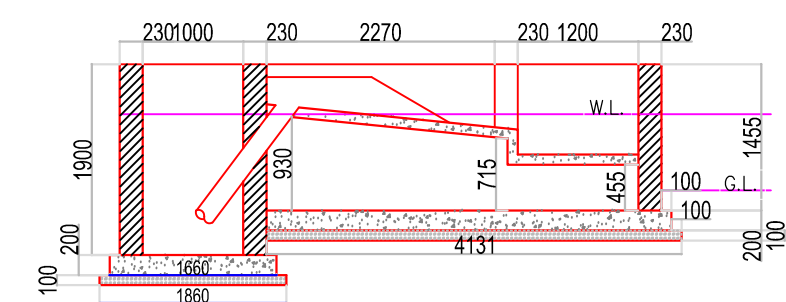
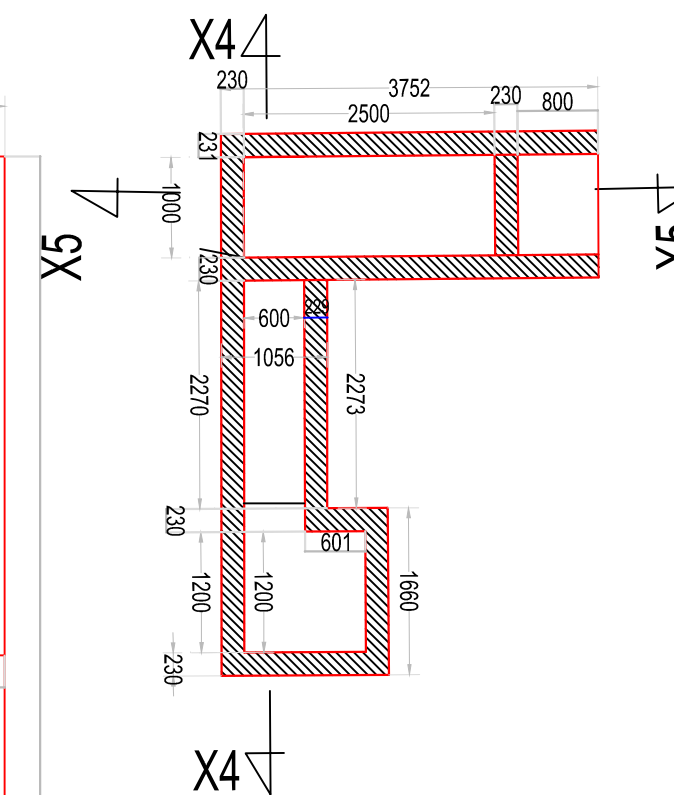
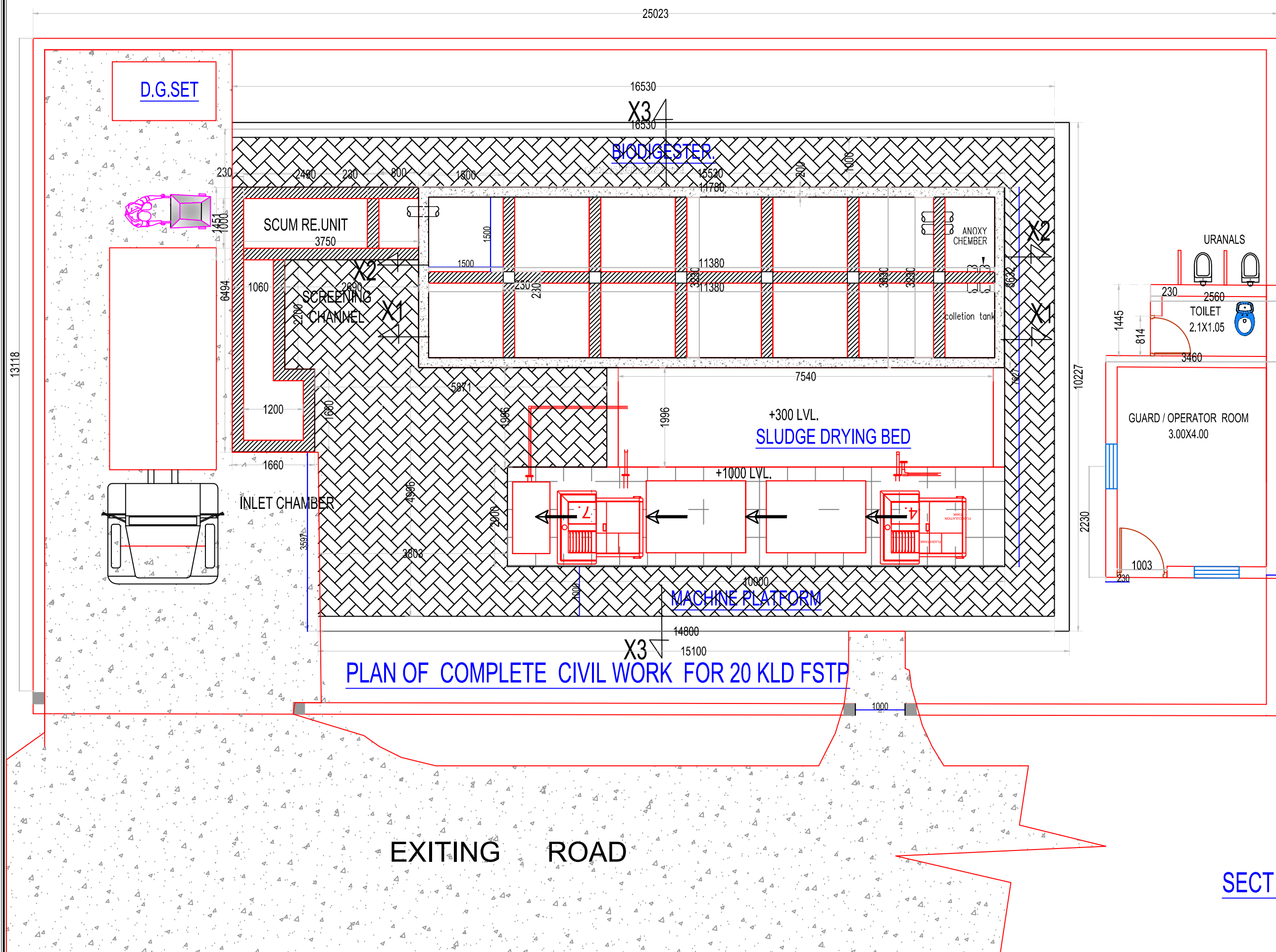
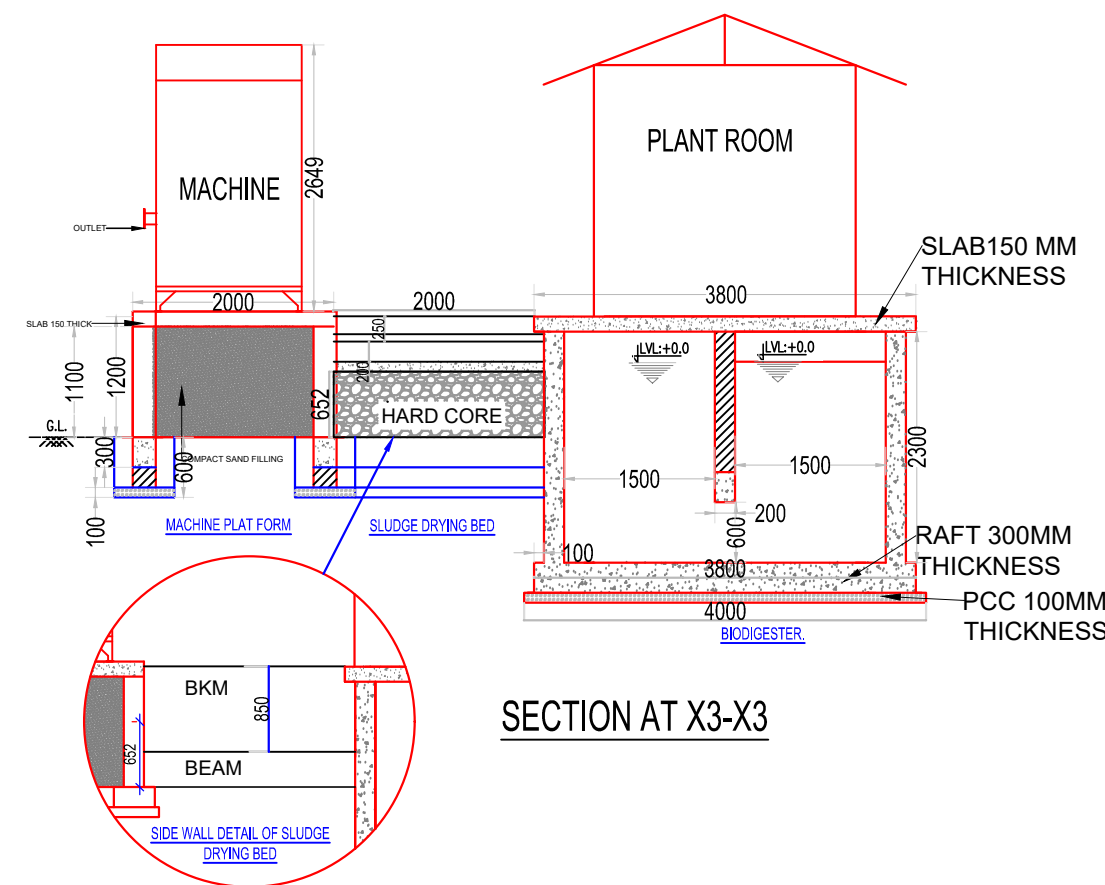
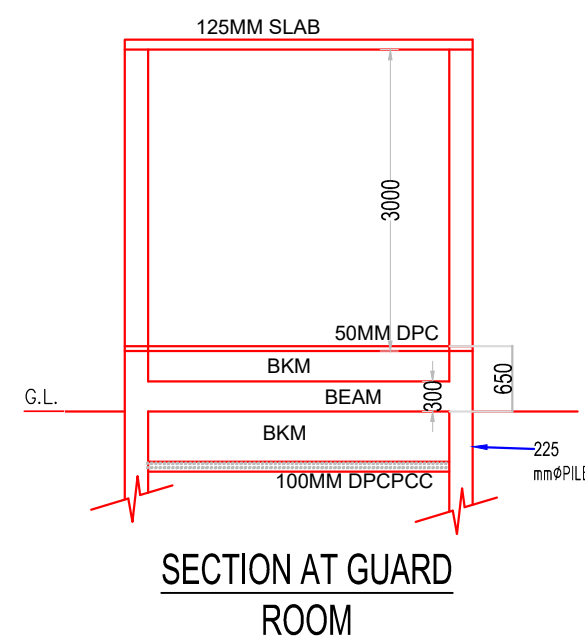


MACHINE PLATFORM





SECTION OF BIO-DIGESTER



SECTION OF INLET CHAMBER/SCREENING AND SCUM REMOVAL UNIT

DEPARTMENT:	MJP
PROJECT:	10 KLD FSTP
NOTE:	1.ALL DIMENSIONS & LEVEL ARE IN MILLIMETERS 2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. 3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.
AREA STATMENT	
TOTAL AREA	25 Mt.X13.6 Mt.
AREA OF PLANT	15.5 Mt.X7.6 Mt.
BOUNDRY WALL	71.5 Rmt.
MAIN GATE	4.5 Rmt.
WICKET GATE	1.2 Rmt.
OPERETOR ROOM	4.0Mt.X3.0Mt.
INDEX	
	REINFORCED CEMENT CON.
	PLAIN CEMENT CONCRETE
	BRICK MASONARY.
DRAWING TITLE:	0 KLD FSTP CIVIL GA DRAWING
DRAWING NO.:	SHEET NO.:
DDB/PRO/GA-01	01B
DATE:	SCALE:
19.02.2021	1:100
CONTRACTOR	



ESTIMATE FOR 20 KLD FSTP							
MEASUREMENT SHEET							
S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
PART 1 FSTP							
<b>(1):- EXCAVATION WORKS</b>							
1	BIO-DIGESTER	1	12.75	4.63	2.44	144.04	M³
2	SLUDGE DRYING BED FOUNDATION	2	2.00	0.60	0.60	1.44	M³
3	MACHINE PLATFORM long span	2	10.37	0.60	0.60	7.47	M³
4	MACHINE PLATFORM short span	2	1.17	0.60	0.60	0.84	M³
5	SCUM REMOVAL CHAMBER	1	4.25	2.46	1.05	10.98	M³
6	SCREENING CHAMBER	1	1.20	2.06	0.60	1.48	M³
7	GRIT CHAMBER/INLET	1	2.66	2.66	0.60	4.25	M³
					<b>Total:-</b>	<b>170.49</b>	
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	BIO-DIGESTER PCC	1	12.20	4.03	0.10	4.92	M³
2	SLUDGE DRYING BED BASE PCC	1	7.54	2.00	0.10	1.51	M³
3	BELOW SIDE WALL PCC	2	2.00	0.60	0.10	0.24	M³
4	MACHINE PLAT FROM FOUNDATION WALL PCC long span	2	10.37	0.60	0.10	1.24	M³
5	MACHINE PLAT FROM FOUNDATION WALL PCC short span	2	1.17	0.60	0.10	0.14	M³
6	SCUM REMOVAL CHAMBER	1	3.96	1.86	0.10	0.74	M³
7	SCREENING CHAMBER	1	1.20	1.46	0.10	0.18	M³
8	GRIT CHAMBER/INLET	1	2.06	2.06	0.10	0.42	M³
9	AROUND THE PEVERS BLOCKS OF PAVMENT	1	45.356	0.3	0.10	1.36	M³
10	BASE CONC.IN TRUCK PARKING	1	13.1	4.66	0.10	6.10	M³
					<b>Total:-</b>	<b>16.85</b>	
<b>(3) :- REINFORCEMENT CONCRETE WORKS RAFT (Grade :-M30)</b>							
1	RAFT(30) FOR BIO-DIGESTER	1	11.98	3.83	0.30	13.77	M³
2	RAFT (M30) FRO SC UM REMOVAL CHAMBER	1	3.86	1.66	0.20	1.28	M³
3	RAFT (M30) FOR SCREENING CHAMBER	1	2.10	1.26	0.20	0.53	M³
4	RAFT (M30) GRIT CHAMBER	1	1.86	1.86	0.20	0.69	M³
					<b>Total:-</b>	<b>16.27</b>	
<b>(4) :- REINFORCEMENT CONCRETE WORKS FOR BEAM(Grade :-M30)</b>							
1	SLUDGE DRYING BED SIDE BEAM	2	2.20	0.23	0.23	0.23	M³
2	BEAM PARTITION CENTER WALL	1	10.30	0.23	0.30	0.71	M³
3	FOUNDATION BEAM IN MACHINE PLAT FORM LONG SPAN	2	10.00	0.23	0.30	1.38	
	BEAM IN MACHINE PLAT FORM SHORT SPAN	2	1.54	0.23	0.30	0.21	
					<b>TOTAL</b>	<b>2.54</b>	
<b>(5) :- REINFORCEMENT CONCRETE WORKS FOR COLUMN (Grade :-M30)</b>							
1	COLUMN (M300)	6	0.23	0.23	3.55	1.13	M³
					<b>TOTAL</b>	<b>1.13</b>	
<b>(6) :- REINFORCEMENT CONCRETE WORKS FOR Vertical Wall/SLAB (Grade :-M30)</b>							
1	BIO -DIGESTER LONG SPAN OUTER WALL	2	11.77	0.20	3.55	16.71	M³
2	BIO-DIGESTER SHORT SPAN OUTER WALL	2	3.23	0.20	3.55	4.59	M³
3	BOI-DIGESTER ANOXY CHAMBER PARTITION WALL	1	3.23	0.23	3.55	2.64	M³
4	BIO-DIGESTER SLAB	1	11.80	3.63	0.15	6.43	M³
5	MACHINE PLAT FORM SLAB	1	10.00	2.00	0.15	3.00	M³
					<b>TOTAL</b>	<b>33.36</b>	
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings, foundations,slabs, beams, -----etc. complete.(including cost of binding wire) IS 1786, (Bd-F-17/306)</b>							
	TOTAL RCC QTY.	<b>53.29</b>					
	STEEL -90KG/CUM					<b>4.80</b>	<b>MT</b>
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	BIO-DIGESTER PARTION WALL(BUFFLE)	5	1.50	0.23	3.00	5.18	M³
2	BIO-DIGESTER RETURNING WALL	7	1.50	0.23	3.55	8.57	M³
3	BIO-DIGESTER CENTRE WALL	1	10.00	0.23	2.65	6.10	M³
4	MACHINE PLAT FORM FOUNDATION WALL long span	2	10.00	0.23	0.20	0.92	M³
5	MACHINE PLAT FORM FOUNDATION WALL short span	2	1.54	0.23	0.20	0.14	M³
6	MACHINE PLATFORM ABOVE GROUND LEVEL LONG WALL	2	10.00	0.23	1.12	5.15	M³
7	MACHINE PLATFORM ABOVE GROUND LEVEL SHORT WALL	2	1.54	0.23	1.12	0.79	M³

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
8	SLUDGE DRYING SHORT SPAN WALL	2	2.00	0.23	1.25	1.15	M³
9	SCUM REMOVAL CHAMBER LONG SPAN WALL	2	3.75	0.23	2.00	3.45	M³
10	SCUM REMOVAL SHORT SPAN WALL	2	1.00	0.23	2.00	0.92	M³
11	SCREENING CHAMBER LONG SPAN WALL	2	2.27	0.23	1.45	1.51	M³
12	GRIT CHAMBER LONG SPAN WALL	2	1.66	0.23	1.45	1.11	M³
13	GRIT CHAMBER SHORT SPAN WALL	1	1.20	0.23	1.45	0.40	M³
14	GRIT CHAMBER SHORT SPAN WALL	1	0.60	0.23	1.45	0.20	M³
					<b>Total:-</b>	<b>35.59</b>	
<b>(9) :- Hard Course/ MOORUM Filling Work</b>							
1	Sludge Drying Bed Hard course Filling (Moorum)	1	7.54	2.00	0.65	9.83	M³
2	Hard course Filling Machine Platform Foundation	1	9.54	1.60	1.10	16.79	M³
					<b>Total:-</b>	<b>26.62</b>	
<b>(10) :- Media Filter FOR SLUDGE DRYING BED</b>							
1	2 to 12 mm mix gravel filter media	1	7.54	2.00	0.20	3.02	M³
					<b>Total:-</b>	<b>3.02</b>	
<b>(11) :- Pevers Block Work</b>							
1	Pevers Blocks for sludge drying bed	1	7.54	2.00		15.08	M²
2	Pevers Blocks In front of Plant Long span	1	16.5	1		16.50	M²
3	Pevers Blocks In Left side of Plant Long span	1	7.62	1		7.62	M²
4	Pevers Blocks In back side of Plant Long span	1	14.8	1		14.80	M²
5	Pevers Blocks in side of screen & Scum chamber	1	4	5.8		23.20	M²
6	Pevers Blocks in side of screen & Scum chamber	1	2.2	2.7		5.94	M²
					<b>Total:-</b>	<b>83.14</b>	
<b>(12) :- PLASTERING IN BIO DIGESTER</b>							
1	Both side plastering in Bio-Digester chamber	10	1.50	3.00		45.00	M²
2	Both side plastering in Bio-Digester chamber	22	1.50	3.55		117.15	M²
3	Center wall plastering in Bio-Digester chamber	2	10.30	2.30		47.38	M²
4	Bio digester outer long wall plastering	2	11.80	3.55		83.78	M²
5	plaster in scum removal outer	1	3.75	2.00		7.50	M²
		1	2.69	2.00		5.38	M²
		1	1.46	2.00		2.92	M²
6	plaster in scum removal inner	2	3.30	2.00		13.20	M²
		4	1.00	2.00		8.00	M²
7	screening outer	2	2.20	1.55		6.82	M²
	screening inner	2	2.43	1.55		7.53	M²
8	grit chamber outer	3	1.66	1.55		7.72	M²
		1	0.60	1.55		0.93	M²
	grit chamber inner	3	1.20	0.90		3.24	M²
		1	0.60	0.90		0.54	M²
					<b>Total:-</b>	<b>293.31</b>	M²
<b>PART 2) GAURD ROOM ,TOILET,BOUNDARY WALL</b>							
<b>(1) :- Excavation For Guard Room Foundation/Piling</b>							
1	footing Excavation	6	1.50	1.50	1.00	13.50	M³
2	Excavation GUARD RM wall foundation long wall	2	2.80	0.60	0.60	2.02	M³
	Excavation GUARD RM wall foundation short wall	2	1.80	0.60	0.60	1.30	M³
	Excavation TOI. wall foundation wall	1	0.80	0.60	0.60	0.29	M³
3	Excavation for column footing (C1 type)	2	1.50	1.50	1.00	4.50	M³
4	Excavation for column footing (C2 type)	27	1.20	1.20	1.00	38.88	M³
5	Excavation below boundary wall	1	37.15	0.60	0.60	13.37	M³
					<b>Total:-</b>	<b>73.85</b>	M³
<b>(2):- PLAIN CEMENT CONCRETE WORKS (Grade :-M15)</b>							
1	Column for guard rm& toilet	6	1.50	1.50	0.10	1.35	M³
2	Brick wall foundation PCC	1	20.00	0.40	0.10	0.80	M³
3	Guard Room Flooring PCC	1	3.00	4.00	0.05	0.60	M³
4	Toilet Flooring PCC	1	2.10	1.20	0.05	0.13	M³
5	Urine Pot Flooring PCC	1	1.70	0.70	0.05	0.06	M³
6	PCC for boundary wall column footing (C1 type)	2	1.50	1.50	0.10	0.45	M³
7	PCC for boundary wall column footing (C2 type)	27	1.20	1.20	0.10	3.89	M³
8	PCC below boundary wall	1	37.15	0.60	0.10	2.23	M³

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)	QTY	Unit
					Total:-	9.50	
<b>(3) Footing</b>							
1	column footing raft for GUARD RM& TOI. (M20)	6	1.20	1.20	0.25	2.16	M³
2	RAFT for boundary wall column footing (C1 type)	2	1.20	1.20	0.25	0.72	M³
3	RAFT for boundary wall column footing (C2 type)	27	1.00	1.00	0.25	6.75	M³
					Total:-	9.63	M³
<b>(4) Column</b>							
1	GUARD RM& TOI. Column (M20)	6	0.23	0.23	4.25	1.35	M³
2	boundary wall column(C1 type)	2	0.40	0.40	1.60	0.51	M³
3	boundary wall column (C2 type)	27	0.23	0.23	1.92	2.74	M³
					Total:-	4.60	M³
<b>(5) Beam &amp; lintal beam (M20)</b>							
1	Slab beam long span	2	4.46	0.23	0.20	0.41	M³
2	Slab beam short span	2	3.00	0.23	0.20	0.28	M³
3	Toilet Slab Beam Long span slab beam	1	2.60	0.23	0.30	0.18	M³
4	Toilet Slab Beam Short span slab beam	2	1.20	0.23	0.30	0.17	M³
5	Plinth Beam long span	2	4.00	0.23	0.30	0.55	M³
6	Plinth Beam short span	2	3.00	0.23	0.30	0.41	M³
7	Lintel beam above door	2	3.60	0.23	0.23	0.38	M³
8	Lintel beam above window	2	1.50	0.23	0.23	0.16	M³
9	Toilet Long span plinth beam	1	2.60	0.23	0.30	0.18	M³
10	Toilet Short span plinth beam	2	1.20	0.23	0.30	0.17	M³
11	BOUNDARY WALL PLINTH BEAM	1	63.89	0.23	0.23	3.38	M³
					Total:-	6.26	M³
<b>(6) RCC WALL &amp; SLAB (M20)</b>							
1	Guard room	1	4.66	3.66	0.13	2.13	M³
2	Toilet Short span wall	1	2.66	1.45	0.13	0.48	M³
					Total:-	2.61	M³
<b>(7) :- Providing and fixing in position steel bar reinforcement of various diameters for RCC piles, caps, footings,</b>							
	TOTAL RCC QTY	53.86					
	STEEL -90KG/CUM					2.08	MT
<b>(8) :- BRICKS MESONARY WORKS</b>							
1	guard room long wall	2	4.00	0.23	3.30	6.07	M³
2	guard room long wall	2	3.00	0.23	3.30	4.55	M³
3	Toilet long wall	1	2.56	0.23	3.30	1.94	M³
4	Toilet Short wall	1	1.05	0.23	3.30	0.80	M³
5	BOUNDARY WALL	1	63.89	0.23	1.67	24.54	M³
					Total:-	37.91	M³
<b>(9) :- PLASTERING WORKS</b>							
1	Plastring long wall (Inner)	2	4.00		3.00	24.00	M²
2	Plastring short wall (Inner)	2	3.00		3.00	18.00	M²
3	Plastring Ceiling	1	4.00	3.00		12.00	M²
4	Plastring long wall (Outer)	2	4.46		3.73	33.23	M²
5	Plastring short wall (Outer)	2	3.46		3.73	25.78	M²
6	Plastring toilet (Inner)	2	2.10		3.00	12.60	M²
7	Plastring toilet (Inner)	2	1.05		3.00	6.30	M²
8	Plastring toilet CEILING (Inner)	1	2.10	1.05		2.21	M²
9	Plastring long wall (Outer)	1	2.56		3.73	9.55	M²
10	Plastring short wall (Outer)	1	1.45		3.73	5.41	M²
11	Plastring boundry wall at Inner side	1	70.43		1.67	117.62	M²
12	Plastring boundry wall at outer side	1	71.58		1.67	119.54	M²
					Total:-	386.22	M²
<b>10) Painting/Colouring Work for Guard Room</b>							
	As per item no.9					386.22	M²
<b>11) Guard Room Door</b>							
	Toilet Door	1	1.07		1.83	1.95	M²
		1	0.76		1.83	1.39	M²

S No.	Particulars of item & details of works	No.	L. (M.)	B. (M.)	H& D (M.)		Unit
						QTY	
		Total:-				3.34	M²
12)	Window	2	0.90		0.90	1.62	M²
13)	VENTILATOR	2	0.45		0.45	0.41	M²
14)	Guard Room Plinth filling	1.00	4.00	3.00	0.60	7.20	M³
	Toilet Plinth filling	1.00	2.10	1.05	0.60	1.32	M³
		Total:-				8.52	M³
	OTHERS						
1)	MS gate						
	Main Gate	2	2.50			2.00	no
	WICKET Gate	1	1.00			1.00	no.
2)	W.C. PAN	1	Nos				
3)	Wash Basin	1	Nos				
4)	Urin Pot	2	Nos				
5)	UPVC PIPE 4" dia	6	mt				
6)	Electric Fan	1	Nos				
7)	LED BULB 100 WATT	4	Nos				
8)	Bulb Holders	4	Nos				
9)	Electric wire	20	MT				
10)	PVC pipe for electric fitting	10	MT				
11)	Power switch Board	2	Nos				

DESIGN OF 20 KLD CAPACITY STP				
	Catchment Area, ha	20	KLD	
Values adopted from CPHEEO manual on sewage treatment plant				
November 2013 Chapter 9 table 9.13 page 9-43				
	Parameter	Value adopted	Parameter	Value adopted
	Quantity of effluent discharge	20		KLD
		20		M3/day
	Colour	Black	Unobjectionable	
	Odour	Smell like H <sub>2</sub> S	Unobjectionable	
	Temperature	18°C-27°C	-	
	pH		5.5-9.0	
	Total Solid	40000.0	≤100	Mg/L
	Total dissolved Solid	25000.0		Mg/L
	Suspended Solid	15000.0	≤100	Mg/L
	Volatile Solids	10000.0		Mg/L
	Total BOD <sub>20</sub> °C	100	≤10	Mg/L
	COD	2000	≤50	Mg/L
	Oil & Grease	6000	≤10	Mg/L
	Total Nitrogen (TKN)	700	-	Mg/L
	N-NH <sub>4</sub>	150.00	-	Mg/L
	Org-N	550.00	-	Mg/L
	N-NO <sub>3</sub>	-	-	Mg/L
	Total P	250	-	Mg/L
	Alkalinity		-	Mg/L
	Total Coliform	100000	≤1000	Mpn/100 ml
Minimum values have been adopted between discharge standard into inland surface water and that for and land for irrigation				
	TREATED SEWAGE QUALITY			
	As per CPCB NGT			
	BOD <sub>20</sub> °C	≤10	Mg/L	
	Total Suspended Solid	≤100	Mg/L	
	COD	≤50	Mg/L	
	As	≤10	Mg/L	
	Cd	≤5	Mg/L	
	Cr	≤50	Mg/L	
	Cu	≤300	Mg/L	
	Pb	≤100	Mg/L	
	Hg	≤0.15	Mg/L	
	Ni	≤50	Mg/L	
	Mn	≤1000	Mg/L	
	C/N Ratio	20-40		
	faecal Coliform	1000	MPN/100ml	
	Quantity of Sewage Generated	20000.00	Lpd	
		20.00	KLD	
		20.00	Cum/day	
	Raw Sewage Characteristics			
1	Average Sewage flow entering the treatment plant	20000.00	Lpd	
	Assumed Pea Factor	1.00		DEWATS
2	Pea Sewage flow entering the treatment plant	20000.00	Lpd	
3	COD	25000.00	mg/Lt	
4	BOD	6500.00	mg/Lt	
5	TDS	15200.00	mg/Lt	
6	TSS	15000.00	mg/Lt	
7	pH	4.5 to 11.5		
	Other Characteristics of GRIT CAMER			
	Number of unit	1	no	Number of unit
	total collection time feeding hour	8	hour	Number of unit
	Quantity of Flow Ave	3000 li per hour	be due to collecting from pool vehicle	
		0.05	Cum/minute	

DESIGN OF 20 KLD CAPACITY STP				
	Calculation Assumptions	20	KLD	
Assumed Detention period		14.00	minute	
Volume of the Inlet Chamber		0.70	Cum	
Assumed Depth of Inlet		0.50	m	
Area Required for Inlet Chamber		1.40	Sq.m	
Assumed Length to Breadth Ratio		1.00		
Breadth of the Tank		1.20	m	
Length of the Tank		1.20	m	
Provided Dimensions of Inlet Chamber 2.0 x 2.0 x 0.50 m SWD				
2. Screening Chamber				
Peak Design Flow		0.000	Cum	
Assume Clear spacing between bars		10.00	mm	20-50mm, pg.201 of CPHEEO Manual
Velocity ahead of screen (V)		0.40	m/sec	pg. 202 of CPHEEO Manual
Area of Screen Channel, A = l x V		0.00	m <sup>2</sup>	
Provided		0.15		
Keeping Side Water Depth		0.25	m	
OVER ALL Width of screen		0.00	m	
Provided		0.00	m	
Water depth upstream, H <sub>0</sub> = A/W		0.25	m	
diameter of bar (d)		0.006	m	
Number of opening in chamber, W = X + X - 1 where, X = No. of Opening Clear Space between bars = Thickness of plate		0.00	no	
Provided		38.00	no	
Total effective width of opening, W <sub>0</sub> = X x d		0.372	m	
Assume Angle of inclination		60.00	Degree	
Assumed Detention Period in the Screen Channel		5.00	sec	
Assume Length of the screen chamber		2.00	m	
Provided		0.00	m	
Inclined height of the screen, H <sub>1</sub>		0.29	m	
Velocity through the screen, V = H <sub>1</sub> /W <sub>0</sub>		0.00	m/sec	
Head loss through screen in normal condition, $h_1 = 0.0729 \frac{V^2}{V_0^2} - V_0^2$		-0.01	m	less than 0.15 m hence ok
Head loss on 50% logging $h_1 = 0.0729 \frac{V^2}{V_0^2} - V_0^2$		-0.01	m	less than 0.3 m hence ok
Water Depth downstream H <sub>b</sub> , $H_b = \frac{a-b}{2g} + \frac{V^2}{2g} + H_a$ - Head loss through screen in normal condition		0.27	m	
Water Depth downstream H <sub>b</sub> , $H_b = \frac{a-b}{2g} + \frac{V^2}{2g} + H_a$ - Head loss through screen in logged condition		0.27	m	
Provided Dimensions of Screening Chamber 0.0 M x 0.0 M x 0.0 M SWD 0.2 M provided				
Effluent concentration				
Effluent		00.00	mg/Lt	
Concentration		25000.00	mg/Lt	

DESIGN OF 20 KLD CAPACITY STP				
	Catchment Area, ha	20	KLD	
1. Preliminary Design				
No. of tanks		1		Refer to design
Computation of Settling Velocity, Stokes Law				
Kinematic Viscosity of effluent assumed		0.000011	m <sup>2</sup> /sec	
Particle Diameter assumed		0.000150	m	
Settling Velocity		0.02	m/sec	Pg.208,209 of CPHEEO manual
Reynold's number, Re <sub>v</sub> = V <sub>s</sub> ρ/μ		2.73		
For Transition flow, V <sub>s</sub> = 0.707 S <sub>0</sub> <sup>1.6</sup> V <sub>0.6</sub> <sup>-0.714</sup>		0.02	m/sec	Pg.208,209 of CPHEEO manual
Actual Settling velocity		0.02	m/sec	Pg.208,209 of CPHEEO manual
Removal efficiency		491.36	um/m/d	
Assumed Removal Efficiency		75.00	%	
		368.52	um/m/d	
Actual Surface Overflow Rate : Q/A V <sub>s</sub> / [(1-η) <sup>-0.125</sup> - 1]		974	um/m/d	Pg 209-table n.125, as per table 11.1-ii of 1555
Design Flow		20.00	m <sup>3</sup> /d	
Total Plan area of Grit channel = Pea <sub>g</sub> /A <sub>g</sub>		0.02	m <sup>2</sup>	
Assumed width of Grit channel		0.00	m	
Assumed depth of Grit channel		0.00	m	
Liquid Depth assumed		1.50	m	
Provide a depth for the Grit Storage		0.30	m	
Preliminary Design of Sewer Treatment Plant				
2. Design of Sewer Treatment Plant				
Design Flow		0		
Design Flow		0		
Design Flow		0.00	mg/Lt	
Design Flow		15000.00	mg/Lt	
3. Design of Sewer Treatment Plant				
Peak Design Flow		20.00	Cum/day	
Assumed Detention period		96	hour	
Volume of the Tank		80	Cum	
Assumed Depth of Liquid Column		3	m	
Area required for the equalization tank		26.66666667	Sq.m	
No. of Tanks Proposed		12		
Area required for each equalization tank		2.222222222	Sq.m	
Length to Breadth ratio		1		
Breadth of the tank		1.5	m	
Length of the tank		1.5	m	
4. Design of Sewer Treatment Plant				
Design Flow		2 N	0	Fr
5. Design of Sewer Treatment Plant				

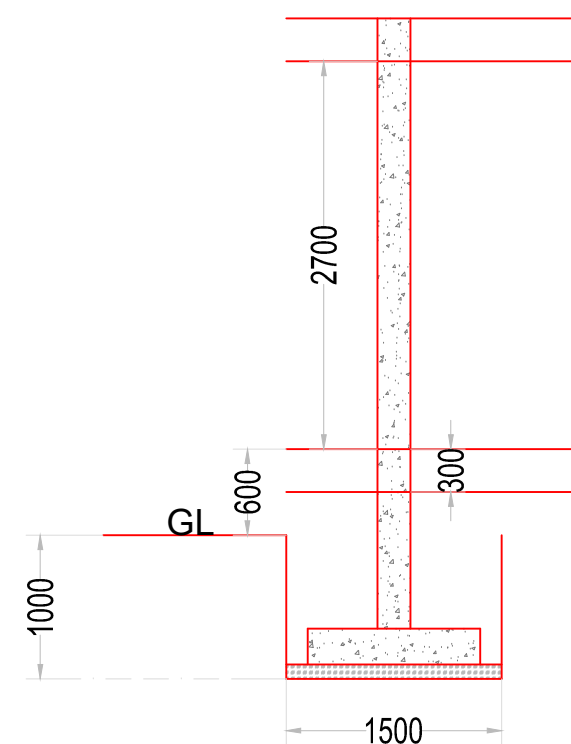
DESIGN OF 20 KLD CAPACITY STP			
CALCULATION OF REQUIRED FLOW		20	KLD
<p>Design flow = (Domestic + Industrial + Fire) + 10% freeboard</p> <p>Domestic = 20 KLD</p> <p>Industrial = 0 KLD</p> <p>Fire = 0 KLD</p> <p>Freeboard = 2 KLD</p> <p>Design flow = 20 + 0 + 0 + 2 = 22 KLD</p>			
Domestic Flow		20	
Industrial Flow		0	
Fire Flow		0	
Freeboard		2	
Design Flow		22	
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Industrial Flow		0	
Fire Flow		0	
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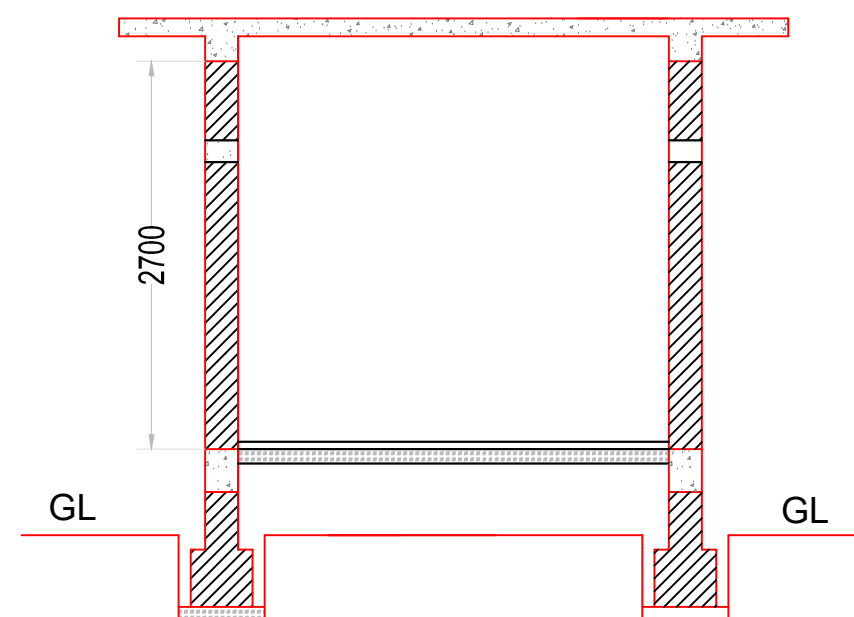
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DESIGN OF 20 KLD CAPACITY STP			
	CALCULATION AND FORMULA	20	KLD
	SOTE at Function of Depth	2.50	m per m depth
	AOTE/SOTE	0.5	
	Pre-aeration Diffuser from manufacturer	0.030	bar
	Depth of Diffuser	2.0	m
	Standard Temperature	25	°C
	Standard Pressure	1.014	bar
	Atmospheric Pressure	1.014	bar
	Air Density at STP	1.200	kg/m³
	O₂ Content in Air	0.2770	kg/m³
<b>8</b>	<b>Area of rectangular tank</b>		
	Provided area of rectangular tank = 0.000000 Wm²		
	Area of tank		
	Incoming BOD of Raw Effluent	175.00	mg/L
	BOD to be reduced	35	mg/L
	BOD Load	3.5	kg/day
	Oxygen required to remove BOD load	2	kg/kg of BOD
	Oxygen required	7.0	kg/day
		0.35	kg/hr
	Area of Rectangular tank required	22.11	Cum
	Area of tank 2		
	Incoming BOD of Raw Effluent	35.10	mg/L
	BOD to be reduced	7	mg/L
	BOD Load	0.7	kg/day
	Oxygen required to remove BOD load	2	kg/kg of BOD
	Oxygen required	1.4	kg/day
		0.07	kg/hr
	Area of Rectangular tank required 2	4.42	Cum
<b>9</b>	<b>Area of Rectangular tank</b>		
	Aeration 1	22.11	m³
	Aeration 2	4.42	m³
	Anoxic	2.05	m³
	Total	28.58	m³
	Settling tank	2	m³
	Area of rectangular tank provided 2 tanks each of 2000 sqm for settling tank 2 tanks provided for effluent treatment tank added		
<b>10</b>	<b>Settling tank</b>		
	Tankage provided	20.00	Cum/day
	after anaerobic digestion Sludge	0.2	
	Sludge disposal in to SDB	0.05	Cum/day
	depth of sludge in SBD	0.20	m
	drying duration	20	day
	Volume of sludge for 10 day	0.50	Cum
	length of each SDB	7.54	m
	width of each SDB	2.00	m
	provide volume of SDB	3.0160	Cum
	required volume of SDB for 60 day	3.00	Cum
	Site of sludge drying bed 7.54 Mt. X 2 Mt.		
<b>11</b>	<b>Capacity of detention tank</b>		
	Assumed Detention time	60.00	Minute
	Average Flow	20.00	Cum/day
	Volume of the tank	0.83	Cum
	Provide a depth of tank as	1.50	m

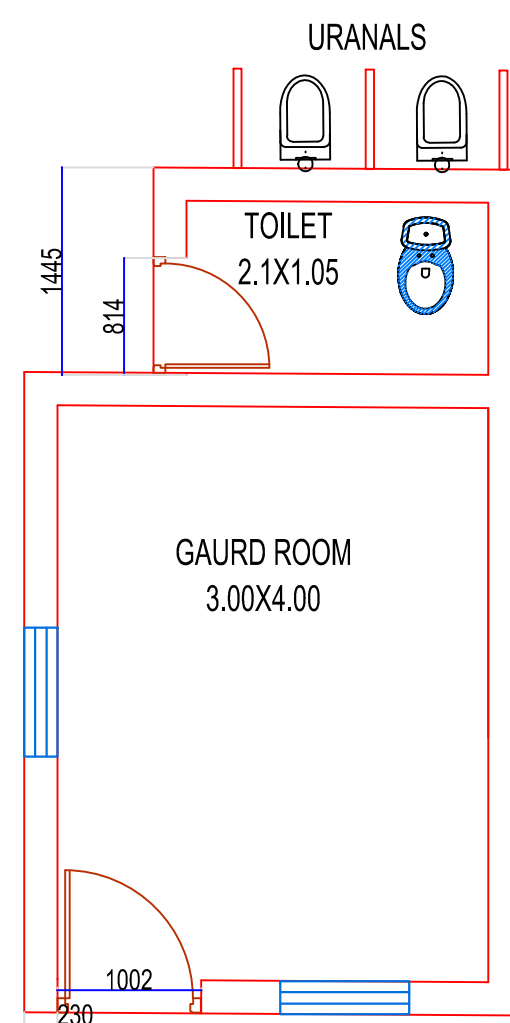
DESIGN OF 20 KLD CAPACITY STP			
	Capacity of Filter	20	KLD
Area of the Tank		0.56	Sq.m
Square tank Size		0.70	m
FRP VESSEL 0.70m			
12	Pre-filter Sand Filter		
Average Flow	20.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Time	2.50	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sq.m	
Area of the Filter required	1.25	Sq.m	
FRP VESSEL 0.70m			
13	Pre-filter Sand Filter		
Average Flow	20.00	Cum/day	
Filter Operating hour	8.00	hr	
Operating Time	2.50	Cum/hr	
Filter Loading rate	2.00	Cum/hr/Sq.m	
Area of the Filter required	1.25	Sq.m	
FRP VESSEL 0.70m			
14	Effluent Discharge		
Discharge Rate	0.00		
Concentration	0.00		
Discharge Rate	0.00	mg/Lt	
Concentration	22.95	mg/Lt	
15	Final Discharge		
Pre-filter Sand Filter	2.00	Cum/hr	
	0.00	Cum/day	
15	Discharge IN LINE		
Discharge Rate	20.00		
Concentration	20.00		
Discharge Rate	0.00	mg/Lt	
Concentration	18.36	mg/Lt	
16	TREATED WATER TANK		
Total Quantity of Effluent	20.00	CUM	
TOTAL LOSS IN PROCESS	15.0		
TOTAL TREATED WATER	17	CUM	
Peak Design Flow	17.00	Cum/day	
Assumed Detention period	2	hour	
Volume of the Tank	4.25	Cum	
Assumed Depth of Liquid column	1.2	m	
Area required for the tank	3.541666667	Sq.m	
No. of Tank Proposed	1		
area required for each tank	3.541666667	Sq.m	
Length to Breadth ratio	1		
Breadth of the tank	2	m	
Length of the tank	2	m	



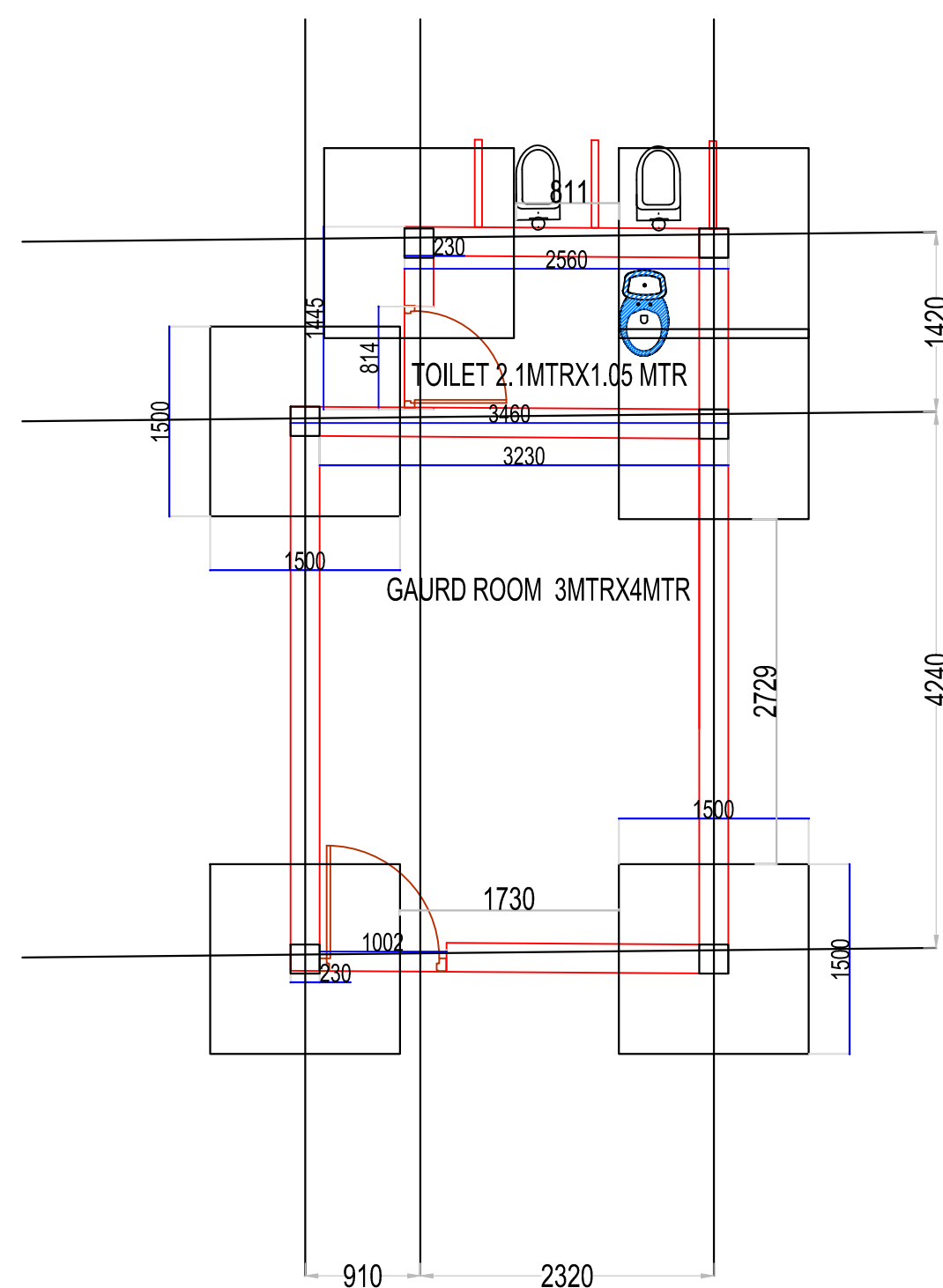
DETAIL OF CLOUMN



SECTION OF GAUARD ROOM



PLAN OF GAUARD ROOM&TOILET



CENTRE LINE PLAN OF GAUARD ROOM&TOILET

DEPARTMENT:

MJP

PROJECT:

20 KLD FSTP

NOTE:  
1.ALL DIMENSIONS & LEVEL ARE IN MILIMETERS  
2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.  
3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.

INDEX

REINFORCED CEMENT CON.

PLAIN CEMENT CONCRETE

BRICK MASONARY.

DRAWING TITLE:  
20 KLD FSTP GAURD ROOM CIVIL GA  
DRAWING

DRAWING NO.: SHEET NO.:

DDB/PRO/GA-01

01C/02

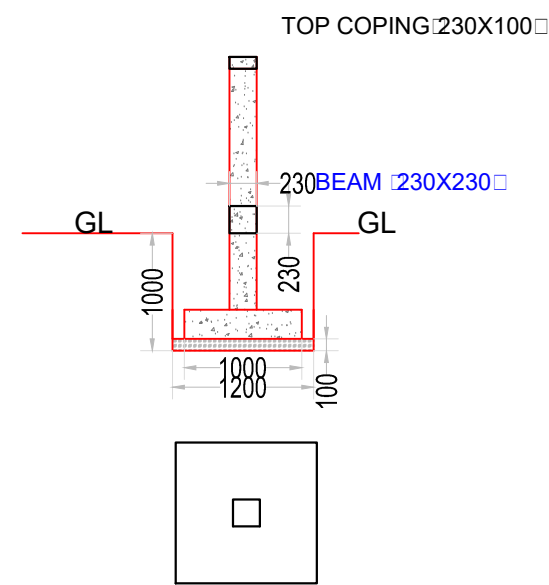
DATE:

19.02.2021

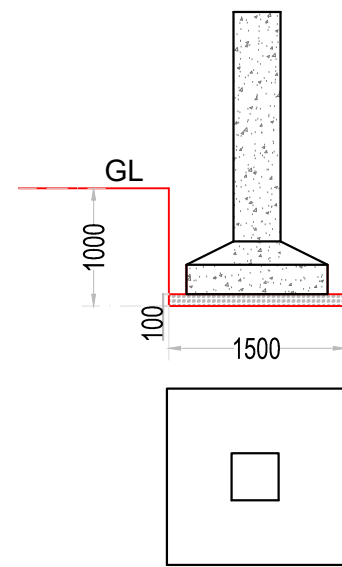
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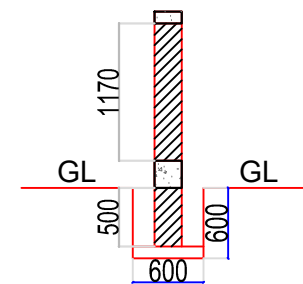
CONTRACTOR



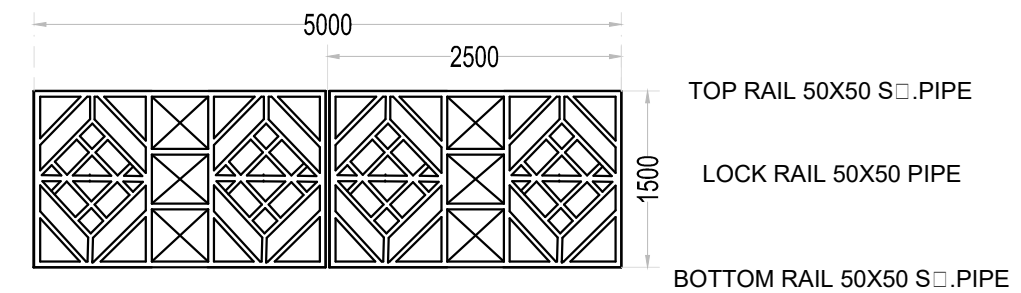
DETAIL OF C2  
27 NO.



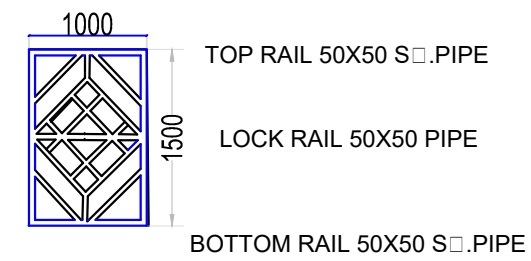
DETAIL OF C1  
2 NO.



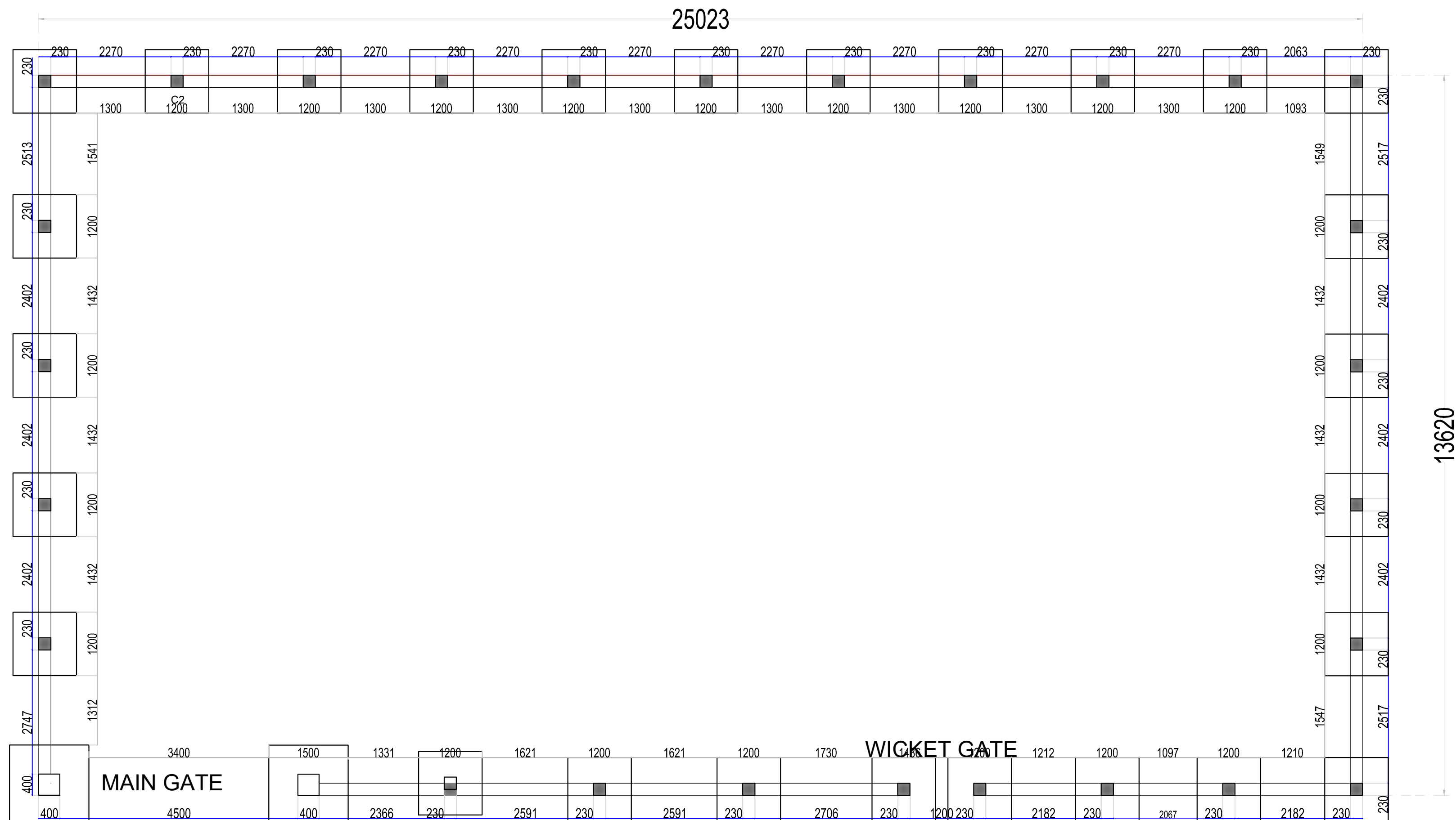
SEC.OF BOUNDARY WALL






MAIN GATE



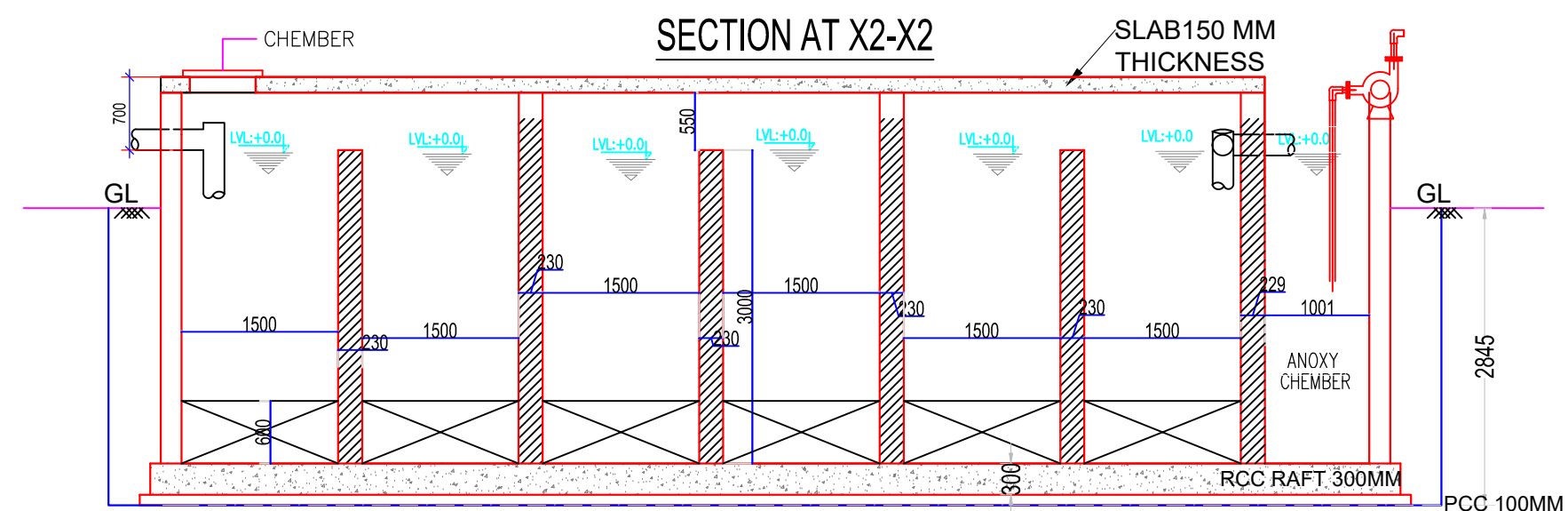
WICKET GATE



DEPARTMENT: <div>MJP</div>	
PROJECT: <div>20 KLD FSTP</div>	
NOTE: 1.ALL DIMENSIONS & LEVEL ARE IN MILIMETERS 2.ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. 3.ANY DISCREPANCY IN THIS DRAWING SHALL BE BROUGHT TO BE IN NOTICE OF CONSULTANT.	
INDEX	
	REINFORCED CEMENT CON.
	PLAIN CEMENT CONCRETE
	BRICK MASONARY.
DRAWING TITLE: <div>0 KLD FSTP    000NDAR0</div> <div>WALL CIVIL GA DRAWING</div>	
DRAWING NO.: <div>DDB/PRO/GA-01</div>	SHEET NO.: <div>01C/03</div>
DATE: <div>19.02.2021</div>	SCALE: <div>1:100</div>
CONTRACTOR	

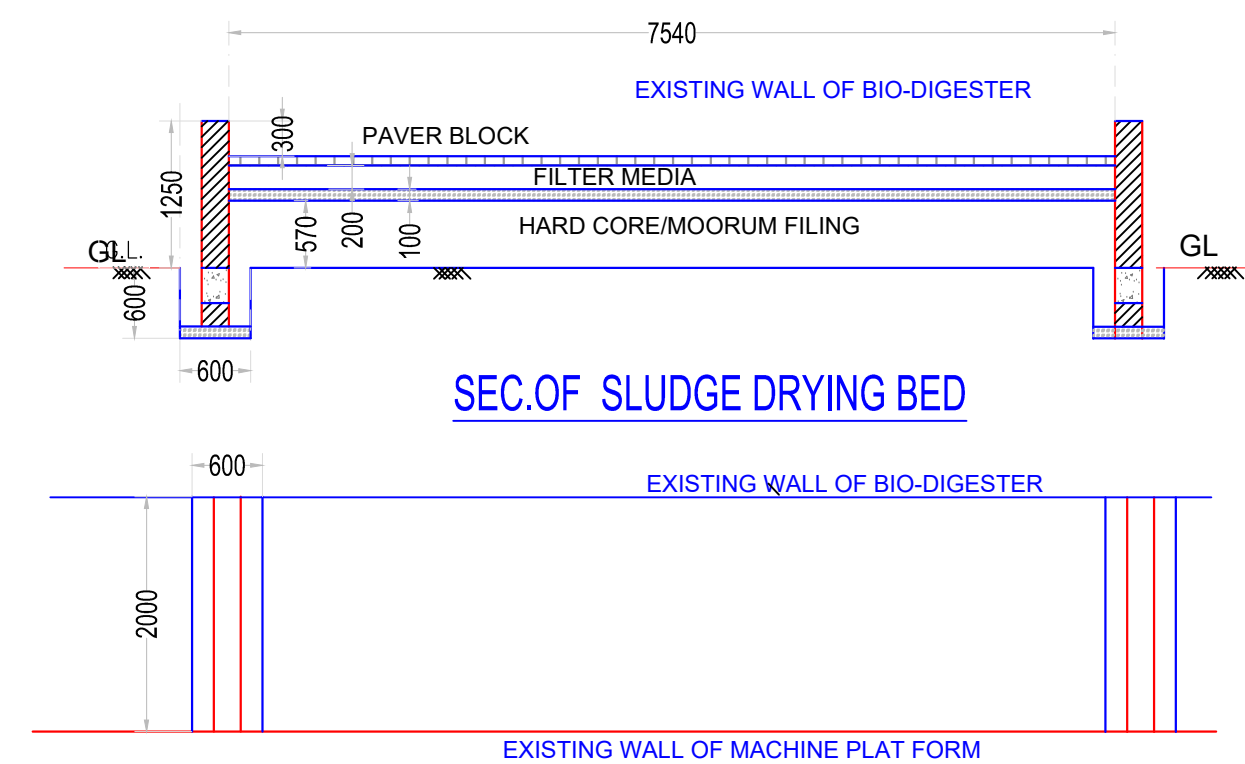
MJP

20 KLD FSTP

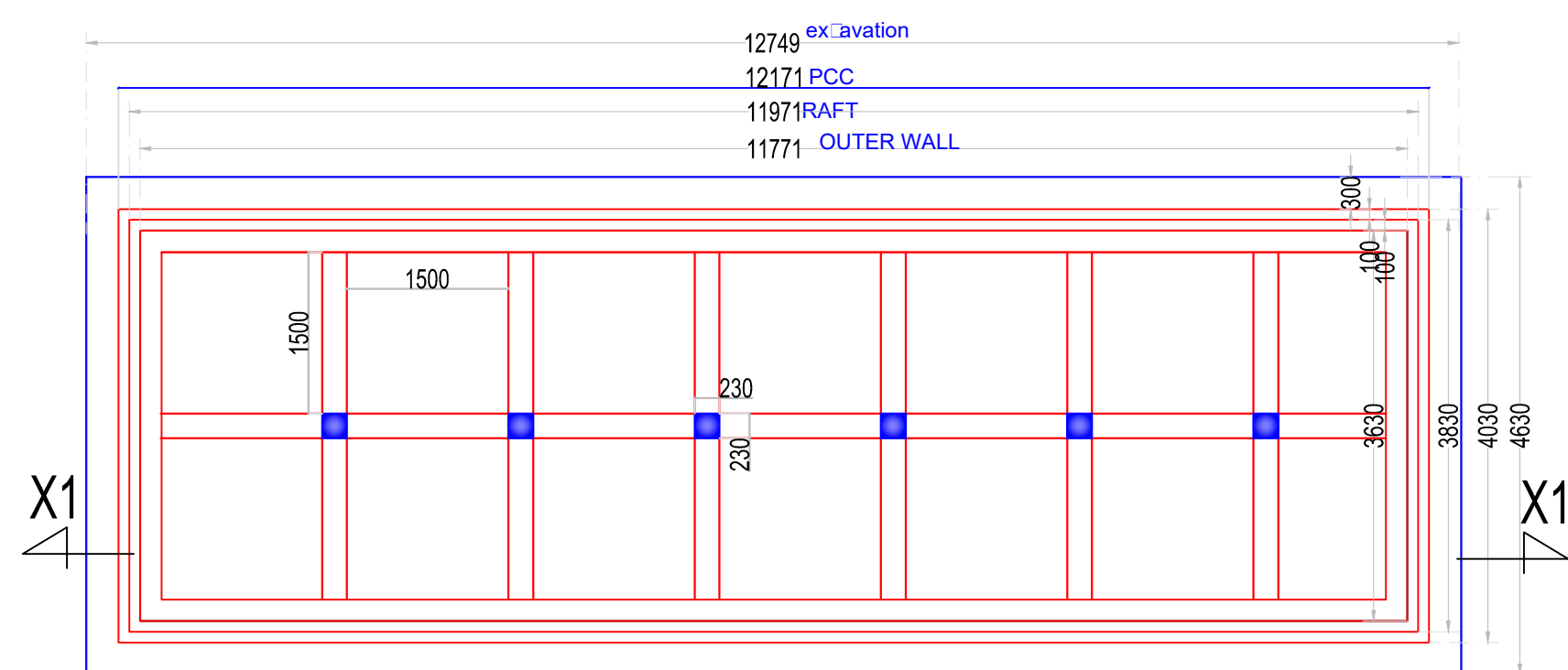


SECTION AT X1-X1

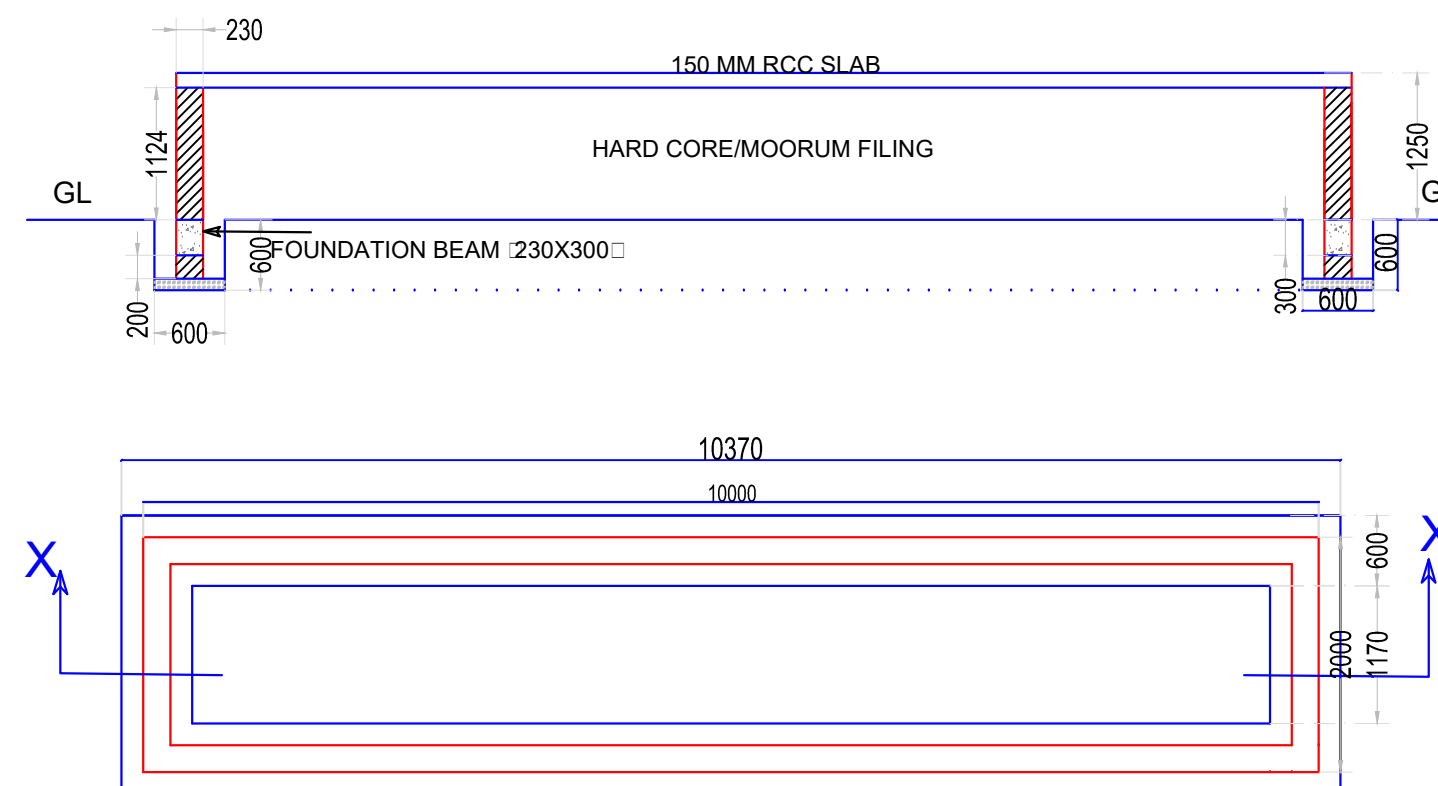
SECTION OF BIO-DIGESTER






### PLAN OF SLUDGE DRYING BED



FOUNDATION PLAN FOR BIODIGESTER.



## MACHINE PLATFORM

	REINFORCED CEMENT CON.
	PLAIN CEMENT CONCRETE
	BRICK MASONRY.

**0 KLD FSTP FNDATION  
CIVIL GA DRAWING**

01C/01

1:100

CONTRACTOR
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